

SONY

DIGITAL AUDIO PROCESSOR

PCM-1630



DIGITAL

OPERATION AND MAINTENANCE MANUAL

1st Edition (Revised 7)

Serial No. 10001 and Higher

Before operating the unit, please read this manual thoroughly and retain it for future reference.

OWNER'S RECORD

The model and serial numbers are located on the rear of the unit. Record the serial number in the space provided below.

Refer to them whenever you call upon an authorized Sony representative regarding this product.

Model No. PCM-1630 Serial No.

Warning—This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a computing device pursuant to Subpart J of Part 15 of FCC Rules.

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SECTION 1

OPERATION

The PCM-1630 is a digital audio processor for professional use, designed to be used with a Sony BVU-800DA/800DB videocassette recorder, a DMR-2000/4000 digital master recorder or any other Sony professional VTR to create a professional PCM recording and playback system.

1-1. FEATURES

High-performance recording and playback

The PCM recording and playback system, including the PCM-1630 and recorders such as a DMR-2000/4000 and a BVU-800DA/DB, gives high performance with the following characteristics:

Frequency response: 20 Hz to 20 kHz $\begin{matrix} +0.5 \\ -1.0 \end{matrix}$ dB

Dynamic range: more than 90 dB

Distortion: less than 0.05%

Wow and flutter: below measurable limit

Digital dubbing with no deterioration

When the unit is connected to two recorders, sound can be dubbed digitally with no deterioration, due to the digital dubbing function of the unit.

Synchronization with video equipment

The unit can be synchronized with an NTSC composite sync signal from a VTR.

Electronic editing

When the unit is used with a DAE-1100/1100A digital audio editor and two recorders, a program can be automatically and electronically edited with precision, and the quality of the editing is more excellent than splice-editing of an analog tape.

Emphasis circuitry

The built-in emphasis circuit improves the signal-to-noise ratio of high frequencies by raising their recording level and lowering their playback level.

Serial data format and interchangeability

A serial data format is employed as a digital input/output format. Since this format is interchangeable with that of a PCM recording and playback system using a Sony PCM-1610 digital audio processor, it is possible to directly transmit and receive digital data between this unit and the PCM-1610 system. Tapes recorded with this unit can be played back with a PCM-1610, and vice versa.

This unit can be used instead of a PCM-1610 in a PCM recording and playback system using a PCM-1610. (The remarkable difference between two units is that the PCM-1630 does not incorporate a time code generator, while a PCM-1610 has a built-in time code generator.)

Two sampling rates selectable

A sampling rate is selectable for recording at either 44.056 kHz (corresponding to the NTSC TV system) or 44.1 kHz (for a compact disc and digital audio system). In an external sync mode, the unit is automatically synchronized with either frequency by synchronizing with an NTSC composite sync signal or a word sync signal.

Linear phase response

To improve the phase response, phase compensation filters are incorporated in the A/D section, and over-sampling FIR (finite impulse response) filters are incorporated in the D/A section.

Level meter for easy setting of a reference level

The level meter with a reference marker function provides two types of signal level indications for precise setting of recording and playback levels.

Two pairs of composite digital (video) signal inputs

The unit is equipped with two pairs of composite digital (video) signal inputs, to make it possible to select alternately composite digital (video) playback signals from two recorders.

Status connector

The status connector, which outputs error data of PCM recorded tapes, makes it possible to analyze tape errors when connected to a DTA-2000 digital tape analyzer.

Small power consumption

Newly developed LSIs incorporated in the logic circuitry reduce power consumption, which enables adoption of a linear power supply in the unit.

Optional printed circuit boards

Optional printed circuit boards make it possible to extend functions of the unit.

• RAR (Read After Read) function

When the unit with an optional RAR board (DABK-1630) installed is used with a digital audio recorder which has a read-after-read function (such as a Sony DMR-4000 digital master recorder), the playback has very high reliability. In addition, with the RAR board installed, a read-after-write function for dubbing and editing can be used with this unit.

• Digital I/O interface

When optional digital I/O boards (DABK-1631) are installed, the analog input/output connectors provide digital input/output data which conforms to the AES/EBU standards.

1-2. SPECIFICATIONS

Number of channels	2 channels
Modulation system	PCM system conforming to the NTSC standard television signal
Sampling frequency	44.1 kHz or 44.056 kHz
Transmission rate	3.5831 Mbit/sec. or 3.5795 Mbit/sec.
Code format	Equivalent to 6 words in 1 H of NTSC TV signal
Quantization	16-bit linear quantization
Dynamic range	More than 90 dB
Harmonic distortion	Less than 0.05% (at reference input level)
Wow and flutter	Below measurable limit
Frequency response	20 Hz to 20 kHz $+0.5$ -1.0 dB
Signal delay time	DIGITAL IN (ENC IN) to DIGITAL OUT (DEC OUT): Approx. 9.7 msec ANALOG IN to ANALOG OUT: Approx. 10.5 msec (increasing by 4.8 msec in RAR mode)
Analog inputs	ANALOG INPUT CH-1(D-I)/CH-2: Cannon XLR-3-31 type, 40 k ohms balanced/20 k ohms unbalanced Reference input level: +4 dBs (to +14 dBs) Maximum input level: +24 dBs (0 dBs = 0.775 V rms)
Analog outputs	ANALOG OUTPUT CH-1(D-O)/CH-2: Cannon XLR-3-32 type, balanced/unbalanced Less than 50 ohms (600 ohm load permissible) Reference output level: +4 dBs (to +14 dBs) Maximum output level: +24 dBs (0 dBs = 0.775 V rms)

Composite digital (video) inputs	COMPOSITE DIGITAL INPUT A/B: BNC-R type, 75 ohms unbalanced 0.714 Vp-p (data level 60 IRE) $\pm 20\%$ COMPOSITE DIGITAL A/B: 8-pin multi- connectors, 75 ohms unbalanced 0.714 Vp-p (data level 60 IRE) $\pm 20\%$	Word sync input	WORD SYNC INPUT: BNC-R type, TTL compatible Input frequency range: 44.1 kHz ± 5 Hz 44.056 kHz ± 5 Hz
Composite digital (video) outputs	COMPOSITE DIGITAL OUTPUT 1/2: BNC-R type, 75 ohms unbalanced 0.714 Vp-p (data level 60 IRE) $\pm 10\%$ COMPOSITE DIGITAL A/B: 8-pin multi- connectors, 75 ohms unbalanced 0.714 Vp-p (data level 60 IRE) $\pm 10\%$	Word sync output	WORD SYNC OUTPUT: BNC-R type, TTL compatible
Composite sync inputs	COMPOSITE SYNC INPUT 1/2: BNC-R type, 75 ohms unbalanced 4 Vp-p, composite sync negative	Status output	STATUS: 25-pin D-sub type connector, RS-422 and TTL compatible
Composite sync outputs	COMPOSITE SYNC OUTPUT 1/2: BNC-R type, 75 ohms unbalanced 4 Vp-p, composite sync negative	Headphone output	HEADPHONES: Stereo phone jack (8 ohms)
Digital inputs	DIGITAL I/O: BNC-R type, TTL compatible, 32-slot serial format 1.4112 Mbit/sec. or 1.4098 Mbit/sec.	Connectable recorders	Sony DMR-2000, DMR-4000, BVU-800DA/DB, BVU-200B, BVH-2000, BVH-1100, BVH-1100A
Digital outputs	DIGITAL I/O: BNC-R type, TTL compatible, 32-slot serial format 1.4112 Mbit/sec. or 1.4098 Mbit/sec.	Recommended editing system	For elementary edit: PCM-1630 and two DMR-4000s For precise edit: PCM-1630, DAE-1100 or DAE-1100A, and two DMR-2000s, two DMR-4000s, two BVU-800DBs or one DMR-4000 and another recorder
		Operating temperature	0°C to 40°C (32°F to 104°F)
		Storage temperature	-20°C to +60°C (-4°F to +140°F)
		Power requirements	100/120/220/240 V ac $\pm 10\%$, selectable 50/60 Hz
		Power consumption	90 W
		Dimensions	424 x 200 x 530 mm (w/h/d) (16 3/4 x 7 7/8 x 20 7/8 inches) including projecting parts
		Weight	26 kg (57 lb 5 oz)

Accessories supplied

Extension board EX-71
(1)
Rack mount adaptor (1
set)
Connection cables with
BNC connectors (2)
8-pin multi-cable
VMC-3P (1)
AC power cord (1)
Operation and
maintenance manual (1)

Design and specifications subject to change
without notice.

Optional accessories

RAR board (RAR-1): DABK-1630
Digital I/O boards (DI-5/DO-17): DABK-1631
EI format boards (ENC-5/DEC-22/RAR-2):
DABK-1632

1-3. RECOMMENDED EQUIPMENT

BVU-800DA/DB U-matic videocassette recorder

This unit can be used as a recorder and
player in various systems, such as a
recording/playback system with a PCM-1630
digital audio processor, or an editing
system with a DAE-1100 digital audio
editor. Using this unit, the SMPTE time
code can be recorded on and read out from a
tape's time code track. The unit also
features a capstan servo, a framing servo
and a logic control system.



DMR-2000 digital master recorder

This unit is designed to be used with the
PCM-1630 digital audio processor to record
and play back digital-quality,
high-fidelity sound. When a DAE-1100/1100A
digital audio editor is used in the system,
highly accurate digital editing is possible
to produce master tapes, which can be used
to produce compact discs.



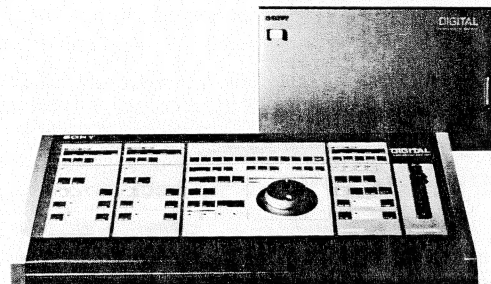
DMR-4000 digital master recorder

This unit is a recorder for the new
generation of CD mastering equipment and
features RAR (Read After Read) and RAW
(Read After Write) functions.
When the DMR-4000 is combined with the
PCM-1630 and the DABK-1630, these functions
will be activated giving the system a high
level of reliability and efficiency.



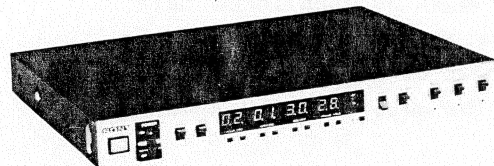
DAE-1100/1100A digital audio editor

This unit is used with a PCM-1630 digital audio processor and a BVU-800DB or DMR-2000/4000 recorder, to provide fully automatic digital-to-digital, high-precision audio editing. The unit also features a search dial for quick access to an edit point, an edit rehearsal function and a review function.



DTA-2000 digital tape analyzer

This unit is designed to output error data of PCM recorded tapes to a printer according to the status signals from a PCM-1630 digital audio processor.

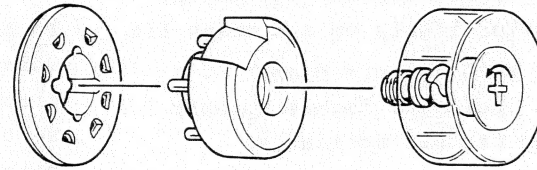


1-4. PRECAUTIONS

1-4-1. On Power Supply

The unit is designed to operate on 100, 120, 220 or 240 V ac. Before connecting the unit to the power source, check to see that the unit's operating voltage is identical with the local power line voltage. The voltage selector is located on the rear panel. If the voltage selector must be reset, proceed as follows. Remove the voltage selector cover with a screwdriver, pull out the selector and re-insert it so that the correct voltage figure appears on the cutout of the selector.

VOLTAGE SELECTOR



1-4-2. On Ventilation

Good air circulation is essential to prevent internal heat build-up in the unit. Place the unit in a location with adequate air circulation. The ventilation holes must be unobstructed to operate the unit properly and to prolong the life of its components.

1-4-3. On Operating Temperature Range

Do not install the unit in a location near heat sources such as radiators or air ducts, or in a place subject to direct sunlight. The temperature range for correct operation of the unit is as follows.

Operating temperature: 0°C to 40°C (32°F to 104°F)

Temperature for which performance of the unit is assured: 5°C to 35°C (41°F to 95°F)

1-4-4. On Warm-up Time of the Unit

After turning the power on, wait for more than 30 minutes to warm up the unit before operating it.

1-4-5. On Analog Inputs and Outputs

When the ANALOG INPUT and OUTPUT connectors of the unit are to be used in an unbalanced connection, be sure to connect the "cold" pin with the "ground" pin. If the "hot" pin is connected with the "ground" pin, a dc electric potential may arise and affect the characteristics.

1-4-6. On Composite Digital (Video) Inputs and Outputs

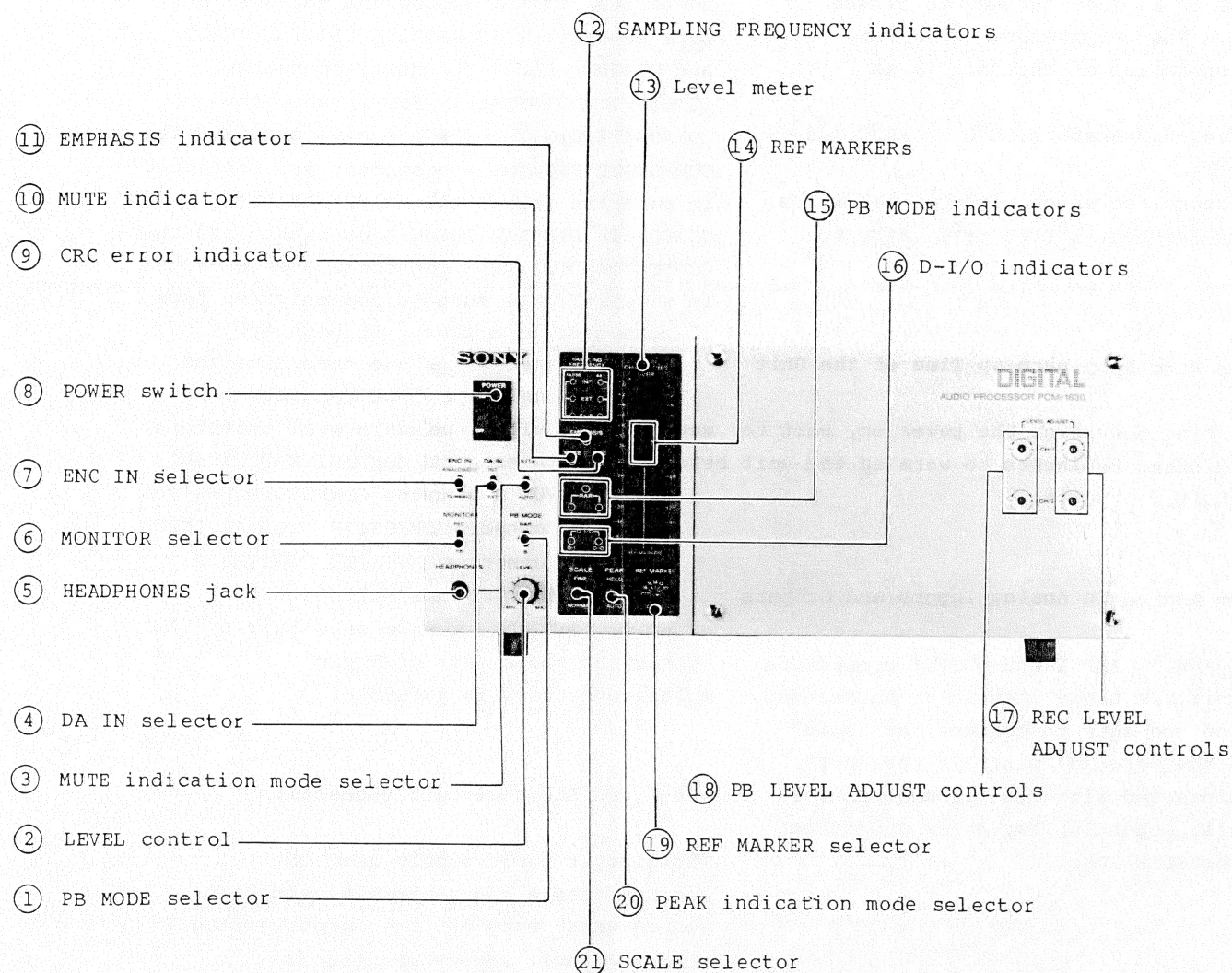
The unit is equipped with two types of composite digital inputs and outputs: BNC type connectors (COMPOSITE DIGITAL INPUT and OUTPUT) and 8-pin multi-connectors (COMPOSITE DIGITAL). For inputs, the COMPOSITE DIGITAL INPUT A connector and the COMPOSITE DIGITAL A connector are connected in parallel inside the unit, and the COMPOSITE DIGITAL INPUT B connector and the COMPOSITE DIGITAL B connector are connected in parallel. Be sure to use only one type of connector at a time. If both types of connectors are used at the same time and signals are input to these connectors simultaneously, the signals will interfere with each other. (The COMPOSITE DIGITAL INPUT A connector and the COMPOSITE DIGITAL B connector, or the COMPOSITE DIGITAL INPUT B connector and the COMPOSITE DIGITAL A connector can be used simultaneously.) For outputs, simultaneous use of a pair of BNC connectors and a pair of 8-pin multi-connectors is possible.

1-4-7. On Short-circuit Protection

The circuit power supply section incorporates a short-circuit protection system which cuts off the output voltage when the power supply section is short-circuited. When the short-circuit protection activates, turn off the power immediately. Wait for more than 30 seconds, then turn the unit on. The output voltage will be restored to normal.

1-5. LOCATION AND FUNCTION OF PARTS AND CONTROLS

1-5-1. Front Panel



① PB (playback) MODE selector

Used to select the playback signal(s). The PB MODE indicators illuminate in accordance with the setting of this selector.

RAR: When an optional RAR-1 circuit board (DABK-1630) is installed in the unit, the RAR (Read After Read) function activates when signals are input simultaneously to the COMPOSITE DIGITAL INPUT A and B

connectors or to the COMPOSITE DIGITAL A and B connectors.

When an RAR-1 circuit board is not installed, the unit operates the same as when this selector is set to "A" (the PB MODE "A" indicator illuminates).

A: The composite digital A input (input to the COMPOSITE DIGITAL INPUT A or COMPOSITE DIGITAL A connector) is selected as a playback signal. When an optional RAR-1 board is installed in the unit and the RAW (Read After Write) function of the board is to be used for dubbing or editing, set the selector to this position. For details, refer to the operation and maintenance manual of the RAR-1 board.

B: The composite digital B input (input to the COMPOSITE DIGITAL INPUT B or COMPOSITE DIGITAL B connector) is selected as a playback signal.

② LEVEL control

Adjusts the volume of the headphones.

③ MUTE indication mode selector

HOLD: Once the muting circuit activates, the MUTE indicator lights up and stays lit as long as the unit is turned on.

AUTO: The MUTE indicator lights up only when the muting circuit activates.

④ DA IN (digital-to-analog input) selector

Selects the source signal to be sent to the built-in D/A converter.

INT: Signals input to the COMPOSITE DIGITAL INPUT connectors (BNC type) or the COMPOSITE DIGITAL connectors (8-pin) are selected.

EXT: Signals input to the DA IN connectors (in the DIGITAL I/O connector section) are selected.

⑤ HEADPHONES jack (stereo phone jack)

Connect stereo headphones with an 8-ohm impedance.

⑥ MONITOR selector

REC: Selects the audio signals to be recorded for monitoring and level meter indication.

PB: Selects the audio playback signals for monitoring and level meter indication.

⑦ ENC IN (encoder input) selector

Selects a source signal to the built-in encoder.

ANALOG (D-I): Selects the signals input to the ANALOG INPUT connectors.

DIGITAL: Selects the signals input to the ENC IN connectors (in the DIGITAL I/O connector section).

DUBBING: Selects the signals input to the COMPOSITE DIGITAL INPUT or COMPOSITE DIGITAL connectors.

⑧ POWER switch

Turns the power on and off.

⑨ CRC (cyclic redundancy check code) error indicator

This indicator lights up when the unit detects a CRC error in the playback signal.

⑩ MUTE indicator

This indicator lights up when the muting circuit activates, depending upon the setting of the MUTE indication mode selector.

⑪ EMPHASIS indicator

This indicator lights up when input data contains a pre-emphasized signal, and the de-emphasis circuit of the unit activates to de-emphasize the detected pre-emphasized signal.

⑫ SAMPLING FREQUENCY indicators

Each indicator lights up, depending upon the sampling frequency (44.056 or 44.1 kHz) of the internal sync signal (INT), external sync signal (EXT) or signal from the tape being played back (FsID).

⑬ Level meter

The indicators on the level meter light up to indicate the input level of each channel during recording, and the recorded level during playback, depending upon the setting of the MONITOR selector and the PEAK

indication mode selector.

The scale of the level meter can be enlarged with the SCALE selector for easy and precise reading of the meter.

The OVER level indicators at the top of the indicator column for each channel light up to warn of an overload during recording.

⑭ REF (reference) MARKERS

The indicator corresponding to the reference level (-10 dB to -20 dB) set with the REF MARKER selector lights up so that the reference signal input level can be adjusted easily.

⑮ PB (playback) MODE indicators

These indicators light up in accordance with the setting (RAR, A or B) of the PB MODE selector.

The A indicator also lights up when the PB MODE selector is set to RAR, without an optional RAR-1 board installed in the unit.

⑯ D-I/O (digital input/output) indicators

The D-I or D-O indicator lights up, depending upon the installed digital input or output board.

D-I: Lights up when an optional DI-5 board is installed in the unit instead of the AD-23 board.

D-O: Lights up when an optional DO-17 board is installed in the unit instead of the DA-15 board.

⑰ REC (recording) LEVEL ADJUST controls

The recording level can be adjusted with these controls within a range of approximately 12 dB. Clockwise rotation raises the signal gain.

⑱ PB (playback) LEVEL ADJUST controls

The output level of the playback signal can be adjusted with these controls within a range of approximately 12 dB. Clockwise rotation raises the playback level.

⑲ REF (reference) MARKER selector

This selector sets the reference signal level within a range of -10 dB to -20 dB in 2-dB steps. The selected reference level is indicated by the illumination of the corresponding REF MARKER indicator.

⑳ PEAK indication mode selector

Selects the manner in which peaks are indicated on the level meter. This selector is effective when the PEAK HOLD switch (SW1) on the MT-16 board is set to ON.

HOLD: The level meter indicates the level of the highest peak while simultaneously following the level of transient peaks below the highest peak. The peak level will be held on the scale until a higher peak occurs, in which case the higher peak is held.

AUTO: Successive peaks are held on the scale for approximately 1.5 seconds, except when a higher peak occurs before 1.5 seconds have elapsed, in which case that peak is immediately indicated. (When the mode select switch (SW4) on the MT-16 board is set to ON, the peaks are held for approximately 4 seconds.)

When the PEAK HOLD switch on the MT-16 board is set to OFF, the level meter activates as a peak meter.

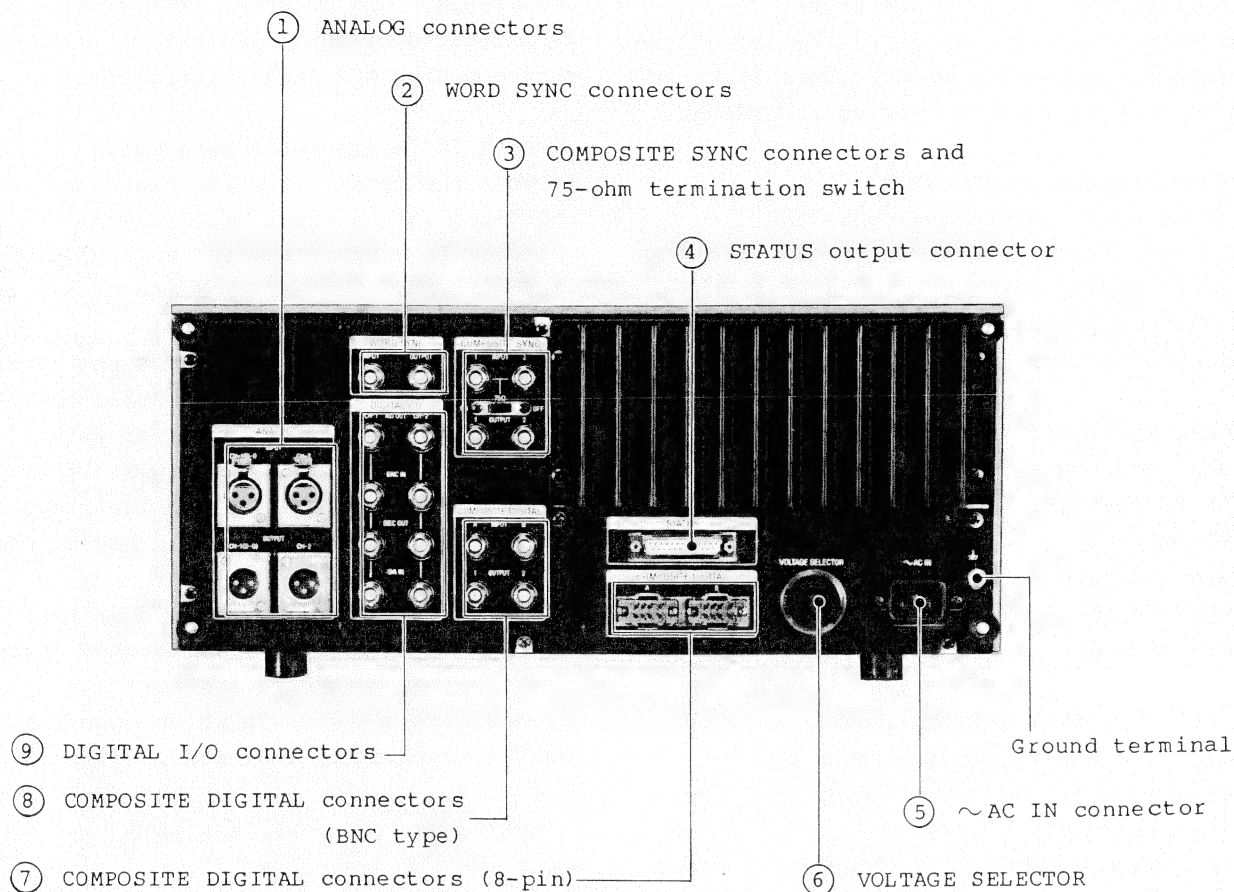
㉑ SCALE selector

This selector selects the scale of the level meter.

FINE: The level meter scale is enlarged, and the signal level is indicated in 0.2-dB steps. If the signal level is above the maximum level of the enlarged scale, the LED of 0 dB will blink, and if the signal level is below the minimum level, the LED of -60 dB will blink.

NORMAL: The level meter scale is as indicated on the front panel.

1-5-2. Connector Panel



① ANALOG connectors (equivalent to Cannon XLR type)

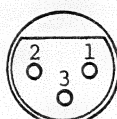
Analog audio signals are input to or output from these connectors.

When optional DABK-1631 digital I/O boards are installed, instead of using the AD-23 and DA-15 boards to provide the unit with a digital interface which conforms to the AES/EBU standards, supply a digital input signal to the INPUT CH-1 (D-I) connector. The unit's digital output signal is supplied from the OUTPUT CH-1 (D-O) connector.

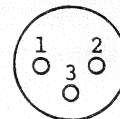
Pin assignment of INPUT and OUTPUT connectors

For the models available in the United States, Canada and Japan	For the model available in European countries
1. Ground 2. Cold 3. Hot	1. Ground 2. Hot 3. Cold

INPUT



OUTPUT



② **WORD SYNC connectors (BNC type)**

A word sync signal of 44.1 kHz or 44.056 kHz is input to the WORD SYNC INPUT connector or output from the WORD SYNC OUTPUT connector.

③ **COMPOSITE SYNC connectors (BNC type) and 75-ohm termination switch**

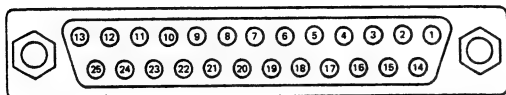
These connectors are input (COMPOSITE SYNC INPUT 1, 2) and output (COMPOSITE SYNC OUTPUT 1, 2) connectors for a composite sync signal. To terminate the INPUT connectors with 75 ohms, set the 75-ohm termination switch to ON. Set the termination switch to OFF to create a looping output (bridge connection).

④ **STATUS output connector (25-pin D-sub type)**

Signals containing status information, such as error flags, are output from this connector. The connector's output circuits except for the RS-422 circuits have open-collectors.

Pin assignment

Pin No.	Signal	Remarks
1	GND	Ground for A/B
2	A/B	A/B select
3	REC/PB	
4	FG	Frame ground
5	HLD	Hold
6	GND	Ground for HLD
7	GND	Ground for PAR
8	---	N. C.
9	AVE	Average
10	GND	Ground for AVE
11	CRC	CRC error
12	GND	Ground for CRC
13	FsID	44.056 kHz: 'H' 44.1 kHz: 'L'
14	EMP	Emphasis ON: 'H'
15	GND	Ground for MUTE
16	MUTE	Muting
17	WCLK	Word clock
18	WCLK	
19	BCLK	Bit clock
20	BCLK	(25-slot)
21	ME CH-1	CH-1 data
22	ME CH-1	(25-slot)
23	ME CH-2	CH-2 data
24	ME CH-2	(25-slot)
25	PAR	Parity error



⑤ **~AC IN (input) connector**

Connect to an ac outlet using the supplied ac power cord.

⑥ **VOLTAGE SELECTOR**

The operating voltage of the unit can be set to 100, 120, 220 or 240 V ac with this voltage selector. To reset the voltage selector, refer to 1-4-1.

⑦ **COMPOSITE DIGITAL (video) connectors (8-pin multi-connectors)**

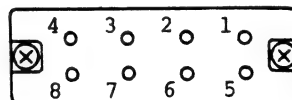
COMPOSITE DIGITAL A: Main composite digital input (connected in parallel with the COMPOSITE DIGITAL INPUT A connector ⑧ inside) and composite digital output.

COMPOSITE DIGITAL B: Auxiliary composite digital input (connected in parallel with the COMPOSITE DIGITAL INPUT B connector ⑧ inside) and composite digital output.

Pin assignment

Pin No.	Signal	Remarks
1	---	N. C.
2	C. D. IN	Composite digital input
3	GND	Ground for C. D. OUT
4	C. D. OUT	Composite digital output
5	---	N. C.
6	GND	Ground for C. D. IN
7	SEL	Connect to ground
8	---	N. C.

Note: "SEL" is a signal for a DMR-2000 digital master recorder.



⑧ **COMPOSITE DIGITAL (video) connectors (BNC type)**

COMPOSITE DIGITAL INPUT A: Main composite digital input.

COMPOSITE DIGITAL INPUT B: Auxiliary composite digital input.

COMPOSITE DIGITAL OUTPUT 1 and 2: Independent composite digital outputs.

⑨ DIGITAL I/O (input/output) connectors
(BNC type)

AD OUT (analog-to-digital output): A/D converted signals are output from these connectors.

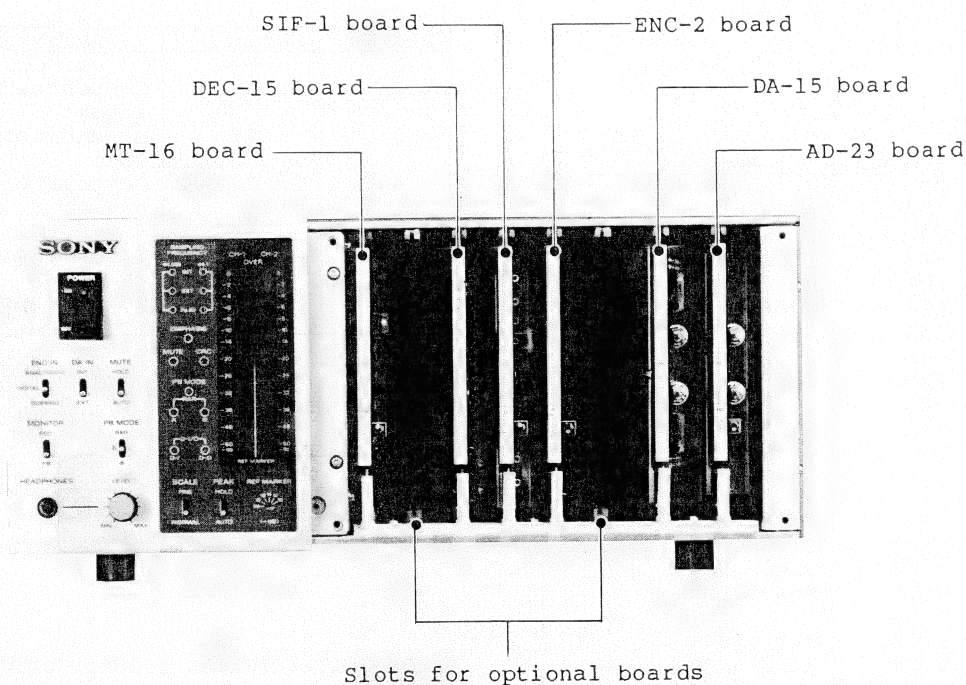
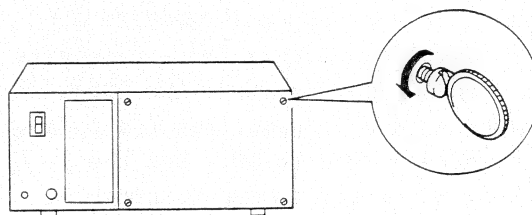
ENC IN (encoder input): Input signals to the built-in encoder are supplied to these connectors.

DEC OUT (decoder output): Signals from the built-in decoder are output from these connectors.

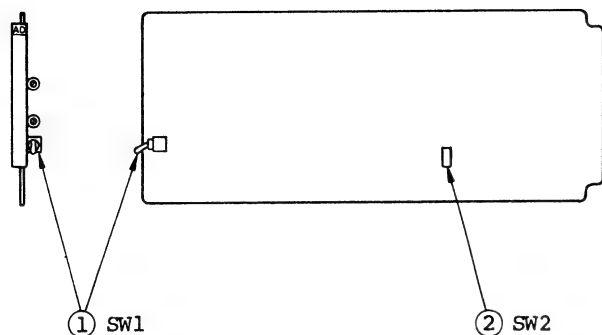
DA IN (digital-to-analog input): Digital signals to be D/A converted are supplied to these connectors.

1-5-3. Printed Circuit Boards

The printed circuit boards are installed behind the right front panel. To adjust the controls and switches on the printed circuit boards, take off the right front panel by removing the four screws with a coin or a large screwdriver.



AD-23 board



① SW1: EMP (emphasis) switch

This switch activates (ON) or deactivates (OFF) the emphasis circuitry during recording.

When this switch is set to ON, the high-frequency response is boosted automatically during recording (pre-emphasis, with a time constant of 50 μ sec./15 μ sec.) to reduce the amount of noise and improve the signal-to-noise ratio (the boosted amount is detected and the response is lowered during playback).

When this switch is set to OFF, a recording is made with the flat frequency response. The EMP switch is factory preset to OFF.

② SW2: Dither switch

This switch activates (ON) or deactivates (OFF) the dither generator circuit.

When this switch is set to ON, the dither is mixed with a low level input signal in order to suppress audible noise. Although the dither level is set at less than 1 LSB the noise level will be raised somewhat when the switch is set to ON.

This switch is factory preset to OFF.

Emphasis identification bits

The setting of the EMP switch does not affect the emphasis identification bits in the output signal data when the ENC IN selector on the front panel is set to a particular position, as shown in the following table. The relationships between the setting of the ENC IN selector and the emphasis identification bits are as follows.

Output signal ENC IN selector	AD OUT connector	COMPOSITE DIGITAL OUTPUT connector	DEC OUT connector
ANALOG	ON/OFF of the EMP switch on the AD board	ON/OFF of the EMP switch on the AD board	Irrelevant*
DIGITAL	ON/OFF of the EMP switch on the AD board	ON/OFF of the emphasis bits in the digital signal data input to the ENC IN connector	Irrelevant*
DUBBING	ON/OFF of the EMP switch on the AD board	ON/OFF of the emphasis bits in the signal data input to the COMPOSITE DIGITAL INPUT connector	ON/OFF of the emphasis bits in the signal data input to the COMPOSITE DIGITAL INPUT connector

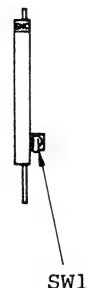
* In the E-to-E or playback mode, the emphasis depends upon the ON/OFF status of the emphasis identification bits in the signal data input to the COMPOSITE DIGITAL INPUT connector(s).

The de-emphasis circuit for playback is activated (ON) or deactivated (OFF), depending upon the setting of the DA IN selector as shown below.

DA IN selector	ON/OFF status of the de-emphasis*
INT	ON/OFF status of the emphasis identification bits in the signal data input to the COMPOSITE DIGITAL INPUT connector
EXT	ON/OFF status of the emphasis identification bits in the signal data input to the DA IN connectors in the DIGITAL I/O connector section

* The EMPHASIS indicator on the front panel lights up or goes off in accordance with the ON/OFF status of the de-emphasis circuit. The emphasis status signal output from the STATUS connector on the rear panel automatically matches the ON/OFF status of the de-emphasis circuit.

ENC-2 board



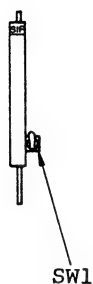
SW1: REC MUTE (record muting) switch

To record a muting signal (signal level is set to "0"), set the switch to ON. Signals output from the COMPOSITE DIGITAL OUTPUT or COMPOSITE DIGITAL connectors are changed into muting signals.

During normal operation, be sure to set the switch to OFF.

The switch is factory preset to OFF.

SIF-1 board



SW1: FS (sampling frequency) selector

This switch selects the sampling frequency when the unit operates in the internal sync mode:

44.1 kHz (upper position)

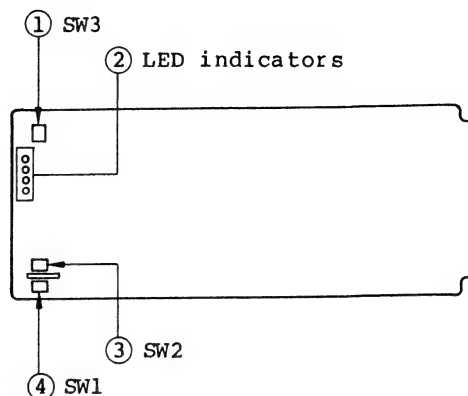
44.056 kHz (lower position)

The selected sampling frequency is indicated by the corresponding INT SAMPLING FREQUENCY indicator on the front panel.

When the unit operates in the external sync mode, the sampling frequency is determined by the frequency of the external sync signal input to the unit. Therefore, the setting of this selector has no effect upon the sampling frequency.

This selector is factory preset to 44.1 kHz.

DEC-15 board



① SW3

This DIP switch is provided to check the functions of the unit.

The switch is factory preset as follows:

Switch No.			
1	2	3	4
ON	ON	OFF	OFF

Do not change the setting of the switches.

② LED indicators

The LED indicators indicate the status of the data being reproduced. The illumination of the indicators shows:

C (green): Correction

A (yellow): Average

H (red): Hold

P (red): Parity error

③ SW2: Muting time/muting ON/OFF switch

This DIP switch determines whether the muting circuit activates or not when an error occurs, and sets the activation time of the muting circuit.

Switch No. 4 activates (ON) or deactivates (OFF) the muting circuit. When switch No. 4 is set to ON, the setting of switches No. 1 to No. 3 determines the time for which the muting circuit activates. When switch No. 4 is set to OFF, the muting circuit does not function.

The muting time can be set with switches No. 1 to No. 3 as follows. The adjustable range is from 1/60 seconds to approximately 2 seconds.

Switch No.				Muting time
1	2	3	4	
x	x	x	OFF	Muting OFF
OFF	OFF	OFF	ON	1/60 sec.
ON	OFF	OFF	ON	1/30 sec.
OFF	ON	OFF	ON	1/15 sec.
ON	ON	OFF	ON	About 0.1 sec.
OFF	OFF	ON	ON	About 0.3 sec.
ON	OFF	ON	ON	About 0.5 sec.
OFF	ON	ON	ON	About 1 sec.
ON	ON	ON	ON	About 2 sec.

x = any position

When the muting circuit deactivates (OFF), slight noise will occur if the composite digital signals input to the COMPOSITE DIGITAL or COMPOSITE DIGITAL INPUT connectors have errors. Therefore, we recommend not setting the muting circuit to OFF during normal operation.

The muting time/muting ON/OFF switch is factory preset as follows:

Muting circuit: ON

Muting time: approx. 1 sec.

(switch No. 1: OFF,

switches No. 2 to 4: ON)

④ SW1: M-SENS (muting sensitivity) switch

This DIP switch adjusts the sensitivity of the muting circuit. That is, it determines how quickly the muting circuit activates when errors occur during tape reproduction. When switch No. 1 only is set to ON, the muting circuit activates for the time set by the muting time/muting ON/OFF switch (SW2), if errors occur in succession for a period of approximately 20 H (TV H). When switch No. 2 only is set to ON, a succession of errors for approximately 10 H activates the muting circuit. Similarly, when switch No. 3 only is set to ON and when switch No. 4 only is set to ON, a succession of errors for the times shown below activates the circuit:

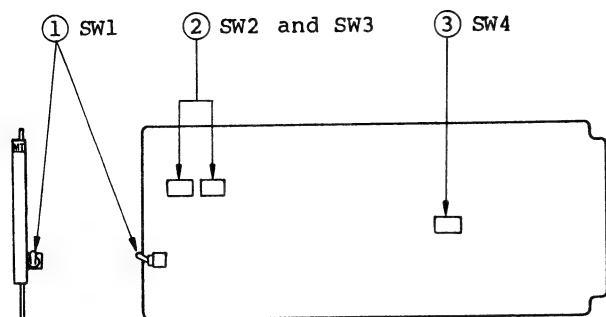
Switch No.				Succession of errors
1	2	3	4	
ON	OFF	OFF	OFF	20 H
OFF	ON	OFF	OFF	10 H
OFF	OFF	ON	OFF	5 H
OFF	OFF	OFF	ON	2 to 3 H

When any of or all of the switches are set to ON simultaneously, a succession of errors for the total time set with these switches activates the muting circuit.

The minimum sensitivity is 32 H; the maximum sensitivity is 2 to 3 H.

The muting sensitivity switch is factory preset to about 20 H (switch No. 1: ON, and switches No. 2 to 4 to OFF).

MT-16 board



① SW1: PEAK HOLD switch

This switch selects the function of the level meter -- as a peak hold meter or a peak meter.

ON: The level meter functions as a peak hold meter. The level of the highest peak is indicated and held on the scale for approximately 1.5 seconds when the PEAK indication mode selector on the front panel is set to AUTO, or until a higher peak occurs when the PEAK indication mode selector on the front panel is set to HOLD. This switch is factory preset to ON.

OFF: The level meter functions as a peak meter. When this switch is set to OFF, the setting of the PEAK indication mode selector on the front panel has no effect upon the level meter indication, and peak levels are not held on the scale even if the PEAK indication mode selector is set to HOLD.

② SW2 for channel 1 and SW3 for channel 2:

Overload indication adjustment switches

These DIP switches set the number of words of full-scale signals (overload signals) continuously input to the unit, which are indicated with the OVER level indicator on the level meter. Up to 8 words can be set for each channel with these switches.

Switch No.								Number of words
1	2	3	4	5	6	7	8	
ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	1
ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	2
ON	ON	ON	OFF	OFF	OFF	OFF	OFF	3
ON	ON	ON	ON	OFF	OFF	OFF	OFF	4
ON	ON	ON	ON	ON	OFF	OFF	OFF	5
ON	ON	ON	ON	ON	ON	OFF	OFF	6
ON	ON	ON	ON	ON	ON	ON	OFF	7
ON	ON	ON	ON	ON	ON	ON	ON	8

These switches are factory preset to 3 words (Nos. 1 to 3 are set to ON, and Nos. 4 to 8 OFF.)

③ SW4: Mode select switch

This DIP switch selects the level meter indication modes. It sets the peak hold time and release time, and determines whether the overload indication is to be held or not.

Switch No.	Indication mode	Switch position	
		ON	OFF
1	Peak hold time	About 4 sec.	About 1.5 sec.
2	Release time	About 100 msec.	About 50 msec.
3	Overload level	Not held	Held
4 to 8	Not used		

All the switches are factory preset to OFF.

OPERATION

1-6. RECORDING LEVEL ADJUSTMENT

1-6-1. Reference Signal Level and Headroom

Headroom means the difference between the reference signal level and the full-scale level. The headroom can be adjusted within a range from 20 dB to 10 dB in 2-dB steps, which is determined by the adjustable range (about 12 dB) of the REC LEVEL ADJUST controls. The adjustable range of the headroom is widest when the reference signal level is +4 dBs (0 dBs = 0.775 Vrms). The maximum input level is +24 dBs. Since the REC LEVEL ADJUST controls do not reduce the gain, the headroom will be less than 20 dB when the reference signal level is above +4 dBs, while the headroom will be more than 10 dB when the reference signal level is less than +4 dBs.

The reference signal levels and their corresponding adjustable headroom ranges are shown below.

Reference signal level	Headroom range
-6 dBs	20 dB
-4 dBs	18 - 20 dB
-2 dBs	16 - 20 dB
0 dBs	14 - 20 dB
+2 dBs	12 - 20 dB
+4 dBs	10 - 20 dB
+6 dBs	10 - 18 dB
+8 dBs	10 - 16 dB
+10 dBs	10 - 14 dB
+12 dBs	10 - 12 dB
+14 dBs	10 dB

(0 dBs = 0.775 Vrms)

1-6-2. Level Meter

The level meter indicates the full-scale level of the A/D converted signal as 0 dB. For example, when the reference signal level is +4 dBs and the headroom is 20 dB, the level meter reads "-20 dB" for an input signal of +4 dBs, and "0 dB" for an input signal of +24 dBs.

1-6-3. Level Adjustment

While observing the level meter, adjust the signal level as follows. Be sure to set the PEAK indication mode selector to AUTO when adjusting the level.

- 1 Set the headroom with the REF MARKER selector. The LED of the REF MARKERS corresponding to the selected headroom will light up. For example, to set the headroom to 16 dB, set the REF MARKER selector to "16". The REF MARKER LED of -16 dB will illuminate.
Note that the REF MARKER selector setting has no effect upon the gain, but only changes the REF MARKER indication.
- 2 Input a reference signal to the unit, and adjust the REC LEVEL ADJUST controls so that the level meter indicators corresponding to the selected REF MARKER LED light up.
- 3 Set the SCALE selector to FINE, and precisely adjust the REC LEVEL ADJUST controls.
The level meter calibration changes to display in 0.2-dB steps above and below the illuminated REF MARKER LED. Only one LED for each channel on the level meter lights up. Adjust the REC LEVEL ADJUST controls so that the level meter matches the illuminated REF MARKER s level.
- 4 Set the SCALE selector to NORMAL.

1-7. CONNECTIONS AND OPERATION

1-7-1. Recording and Playback

An example of a basic connection for recording and playback is shown below.

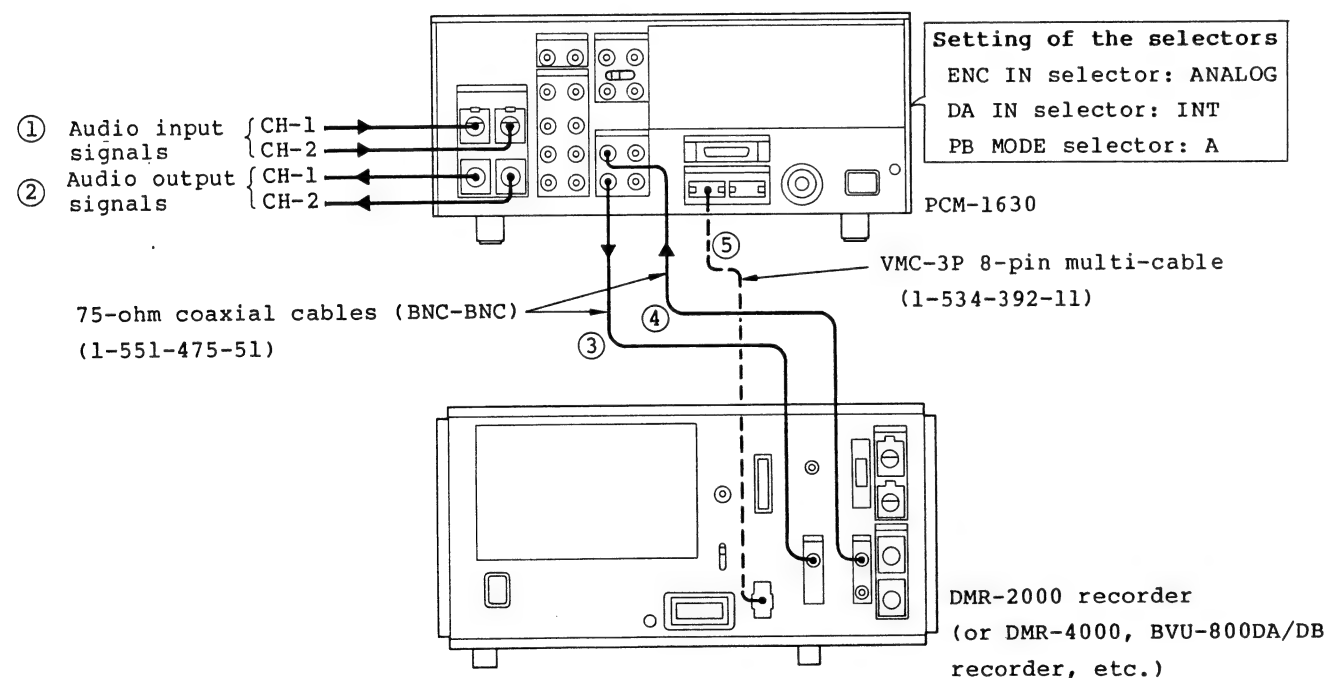
For a recording signal connection: Connect the COMPOSITE DIGITAL OUTPUT connector of the PCM-1630 to the composite digital (video) input connector of recorders such as the DMR-2000/4000, BVU-800DB (③).

For a playback signal connection or connection for monitoring in the E-to-E mode: Connect the composite digital (video) output connector of the recorder to the COMPOSITE DIGITAL INPUT A connector of the PCM-1630 (set the PB MODE selector of the PCM-1630 to A) (④).

When a DMR-2000 or DMR-4000 recorder is used in the system, connections ③ and ④ can be replaced with a single connection with an 8-pin multi-cable (⑤). In this case, **do not make connections ④ and ⑤ simultaneously.**

Notes

- Since the recorder's servo must be locked to the sync signal from the PCM-1630 during playback, supply a composite digital signal or a composite sync signal from the PCM-1630 to the recorder.
- The recording and playback modes can be alternated by pressing the appropriate buttons on the recorder. When a BVU-800DA/DB recorder is used, always set the recorder's dropout compensator circuit to OFF and its framing servo to ON.



1-19 (E)

1-7-2. Digital Dubbing

When two recorders (a recorder for playback and a recorder for recording) are used in the system, a tape can be duplicated without degrading the sound quality. Make the following connections.

For a connection with a player: For a playback signal connection, make connection ③ shown below between the PCM-1630 and the player. For a reference signal connection for the servo, make connection ② or ⑥. **For a connection with a recorder:** For a recording signal connection, connect the PCM-1630 and the recorder as shown with ④. For playback after digital dubbing, connect the COMPOSITE DIGITAL INPUT B connector of the PCM-1630 to the video output connector of the recorder as shown with ⑤.

To duplicate

Set the selectors on the PCM-1630 as follows:

- ENC IN selector: DUBBING
- DA IN selector: INT
- PB MODE selector: A

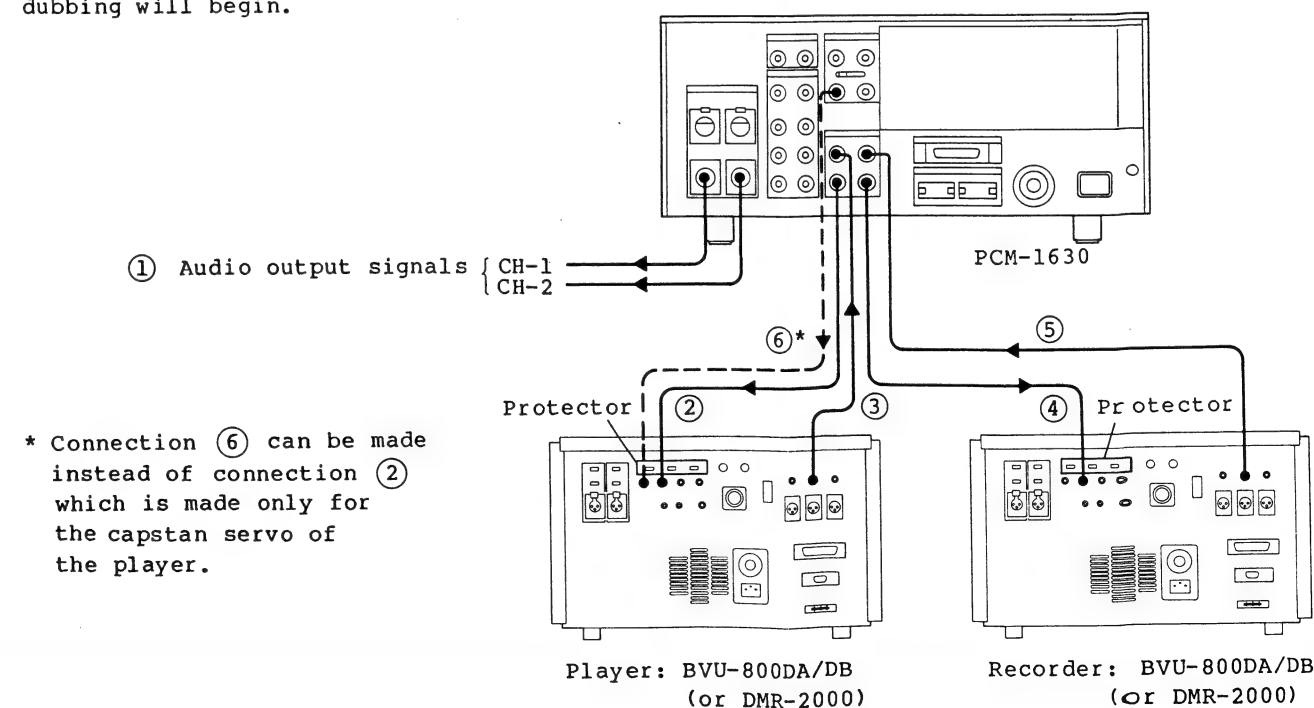
Set the player to the playback mode and the recorder to the record mode. Digital dubbing will begin.

To play back the duplicated tape

It is possible to play back the duplicated tape simply by setting the PB MODE selector on the PCM-1630 to B, without changing the connections. (Setting the ENC IN selector on the PCM-1630 to ANALOG or DIGITAL is recommended.)

Notes

- For digital dubbing, set the FS selector (SW1) on the SIF-1 board of the PCM-1630 to the appropriate position, in accordance with the sampling frequency (indicated by the FSID indicator on the front panel of the PCM-1630) of the tape on the player.
- The emphasis identification bits on the tape being played back are recorded on the tape in the recorder. The setting of the EMP switch (SW1) on the AD-23 board of the PCM-1630 does not affect digital dubbing.
- When the recorder is in the E-to-E mode (the stop mode) during the digital dubbing operation, a loop of the recording signal and the playback signal may oscillate noise. This is not a malfunction. When this occurs, turn down the volume to avoid speaker damage.



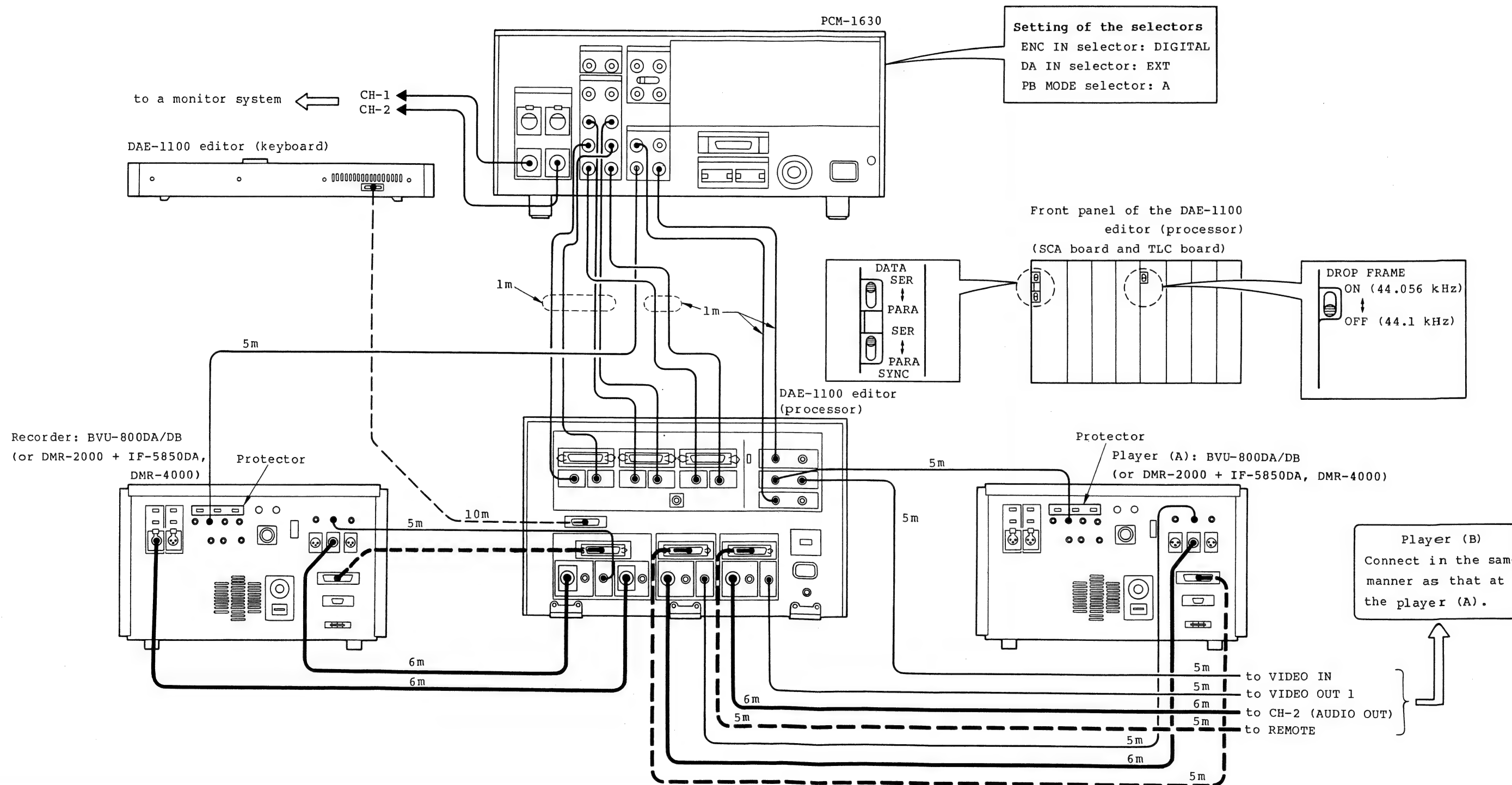
* Connection ⑥ can be made instead of connection ② which is made only for the capstan servo of the player.

1-20 (E)

1-7-3. Editing with a DAE-1100 Digital Audio Editor

Using a DAE-1100 digital audio editor in the system, fully automatic high-precision and high-speed digital-to-digital editing is possible. For details, refer to the operation and maintenance manual of the DAE-1100.

Connecting cables
 ——— 25-pin to 25-pin
 - - - 36-pin to 36-pin
 ——— Cannon XLR type to Cannon XLR type
 ——— BNC type to BNC type



1-7-4. Editing with a DAE-1100A Digital Audio Editor

Connection example

This is an example of an editing system featuring the editing RAW mode with the DMR-4000 digital master recorder. For details, refer to the operation and maintenance manuals of the connected equipment.

Connecting cables

- 25-pin to 25-pin
- 36-pin to 36-pin
- 8-pin to 8-pin
- Cannon XLR type to Cannon XLR type
- BNC type to BNC type

Setting of the selectors
 ENC IN selector: DIGITAL
 MONITOR selector: PB
 DA IN selector: EXT
 PB MODE selector: A
 RAW switch (on the DABK-1630): EDT

PCM-1630 + DABK-1630

DTA-2000
 digital tape analyzer

to a printer

DAE-1100A (keyboard)

Setting of the selectors
 REMOTE/LOCAL selector: REMOTE
 REMOTE-1/REMOTE-2 selector:
 REMOTE-2(36P)
 AUX CH-2 selector: TIME CODE
 TIME CODE selector: REGEN
 RAW OUT selector: SUB

Recorder: DMR-4000

Interface
 box

DAE-1100A
 (processor)

Player: DMR-4000
 (or DMR-2000, BVU-800DB)

1-7-5. Synchronization with Two PCM-1630s

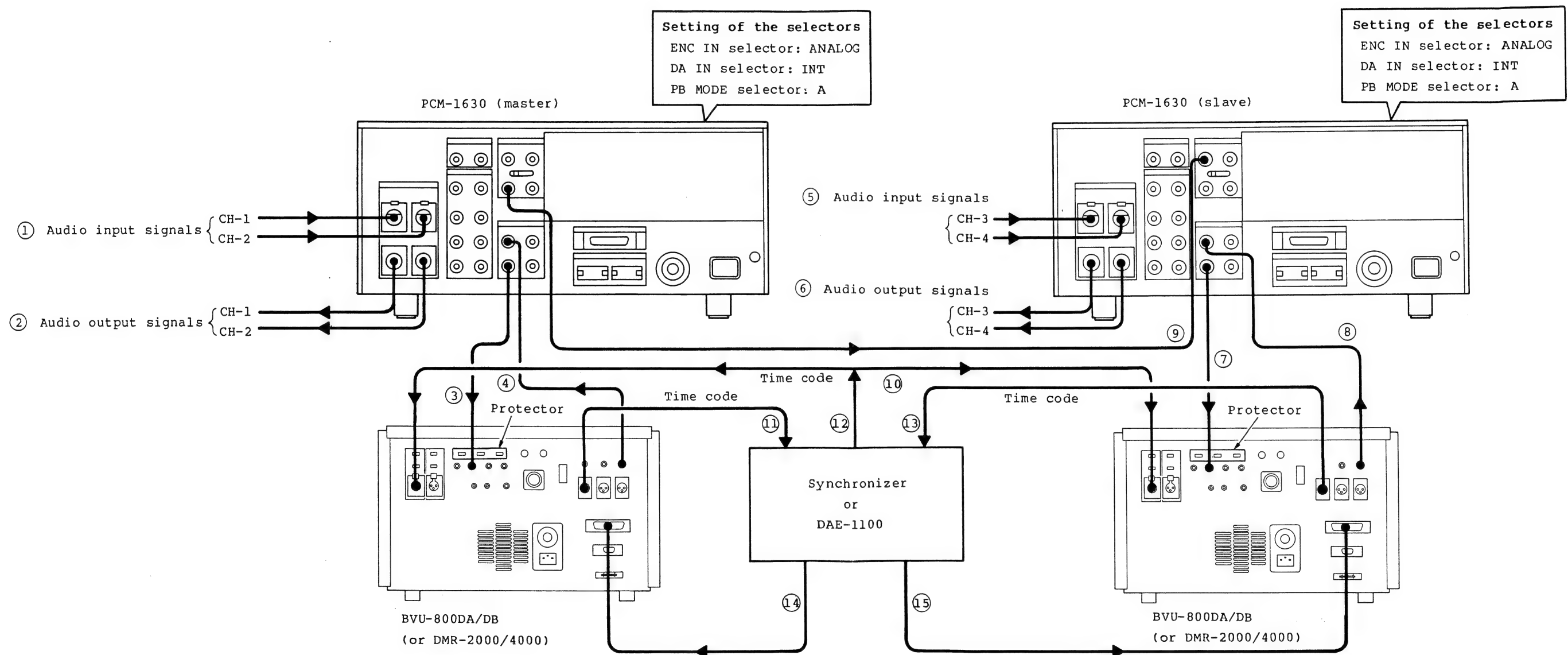
Four-channel recording and playback is possible using two recorders and two PCM-1630s.

Make connections for recording and playback between each recorder and PCM-1630 pair (connections ① to ⑧). To synchronize the two PCM-1630s with each other, connect the COMPOSITE SYNC OUTPUT connector of one

PCM-1630 to the COMPOSITE SYNC INPUT connector of the other (connection ⑨).

For synchronized playback, record the time code on audio channel-2 track of the tape on both recorders.

If the two recorders must be synchronized precisely in frame units during playback, a synchronizer or a DAE-1100 editor is required in the system (connections ⑩ to ⑮).



1-7-6. Recording and Playback of the SMPTE Time Code

If a PCM recorded tape has the time code recorded on it, an edit point can be located easily, and precise editing is possible.

When a DMR-2000/4000 recorder which incorporates a time code generator is used for recording, the time code is automatically recorded on the tape's audio channel-2 track simply by connecting the COMPOSITE DIGITAL OUTPUT connector of the PCM-1630 to the COMPOSITE DIGITAL (VIDEO) IN connector of the recorder (connection ①).

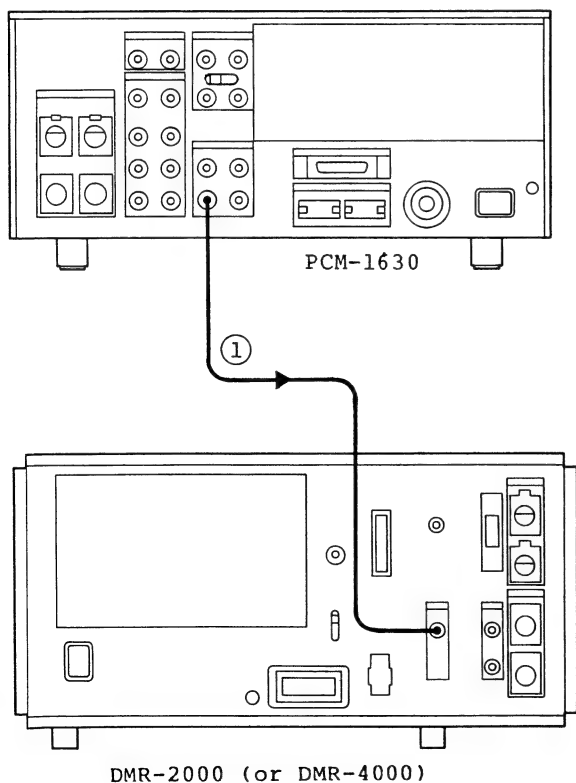
Connection ① supplies a reference signal for the servo lock, as well as a recording signal to the recorder.

When a VTR other than the DMR-2000/4000 is used for recording, a time code generator such as the Sony BVG-1600 and a time code reader such as the Sony BVG-1500 are required in the system. In this case, a composite sync signal must be supplied from the PCM-1630 to the time code generator in order to synchronize the time code generator with the PCM-1630.

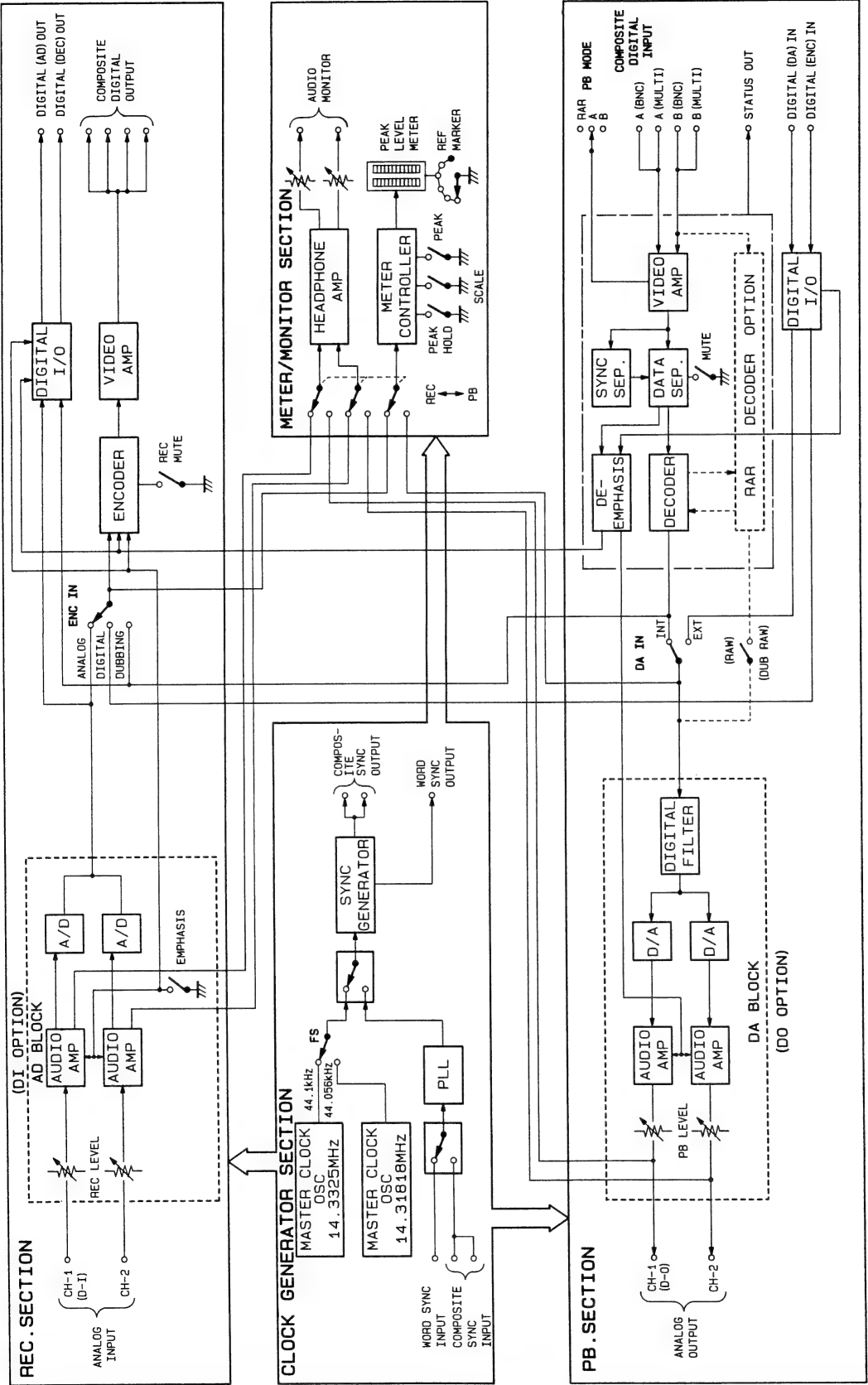
To record the time code on a blank tape When a time code is to be recorded on a blank tape before recording or editing, it is recommended that a muting signal be recorded on the PCM signal track (video track) simultaneously. To record a muting signal, set the ENC IN selector of the PCM-1630 to ANALOG and the REC MUTE switch on the ENC-2 board of the PCM-1630 to ON. A muting signal containing sampling frequency information and emphasis information is output from the COMPOSITE DIGITAL OUTPUT connector of the PCM-1630. Connect the PCM-1630 and the recorder in the same manner as that used to make the connection for time code recording/playback.

Note

After completing the time code recording, be sure to return the REC MUTE switch of the PCM-1630 to OFF. If the switch remains ON, a recording cannot be made.

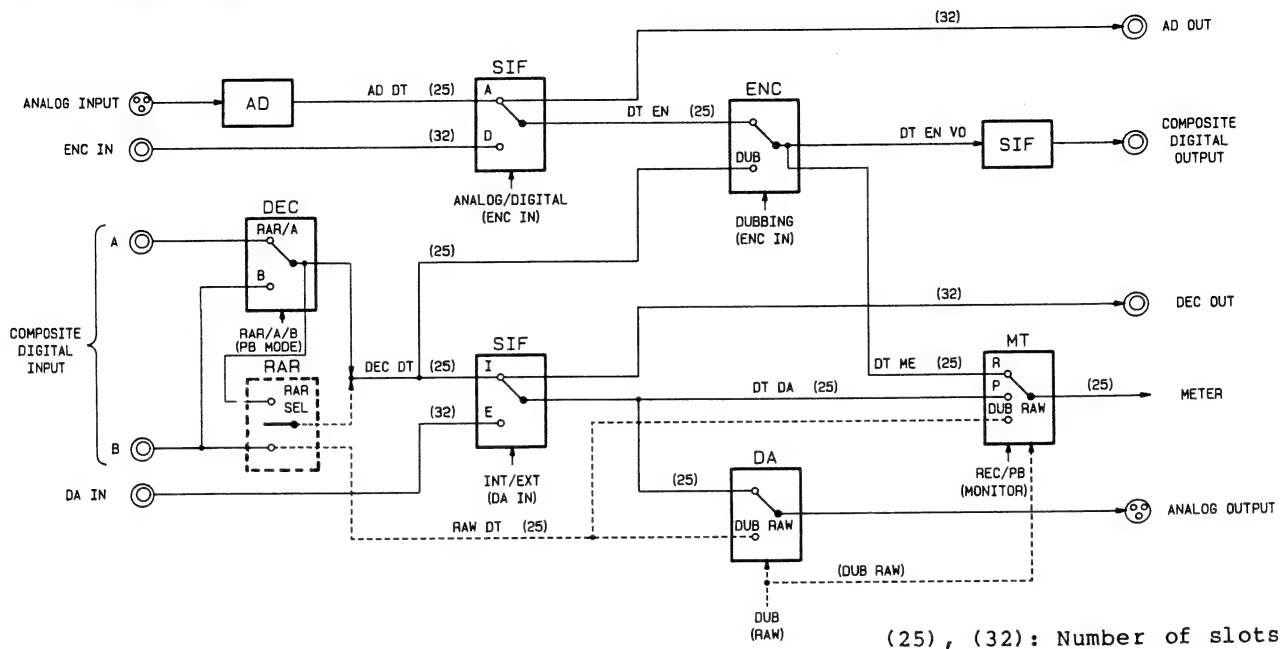


1-8. BLOCK DIAGRAM



1-9. SIGNAL FLOW

1-9-1. Data Flow



Switches

ENC IN selector: ANALOG/DIGITAL/DUBBING

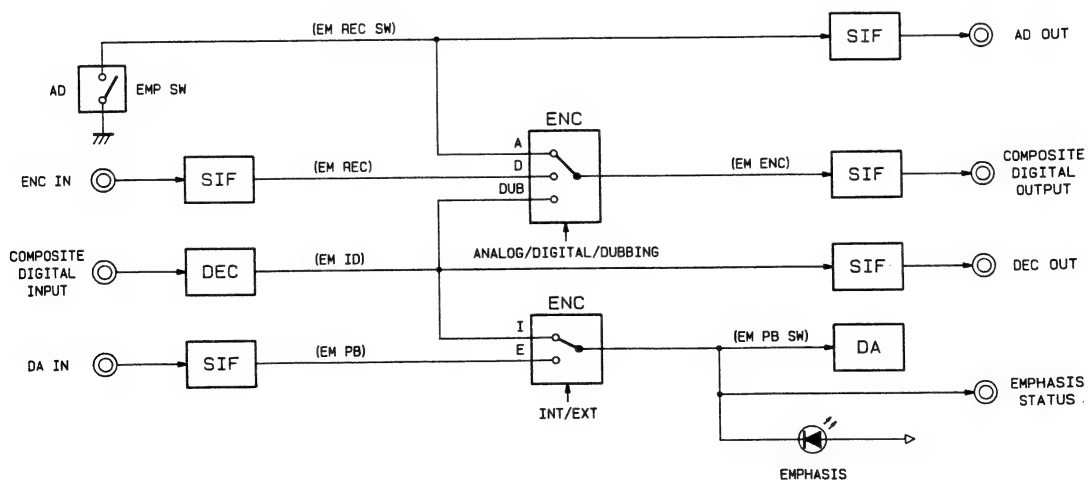
DA IN selector: INT/EXT

MONITOR selector: REC/PB

PB MODE selector: RAR/A/B

RAW selector (on the optional RAR-1 board): EDT/OFF/DUB

1-9-2. Emphasis Data Flow



Switches

ENC IN selector: ANALOG/DIGITAL/DUBBING

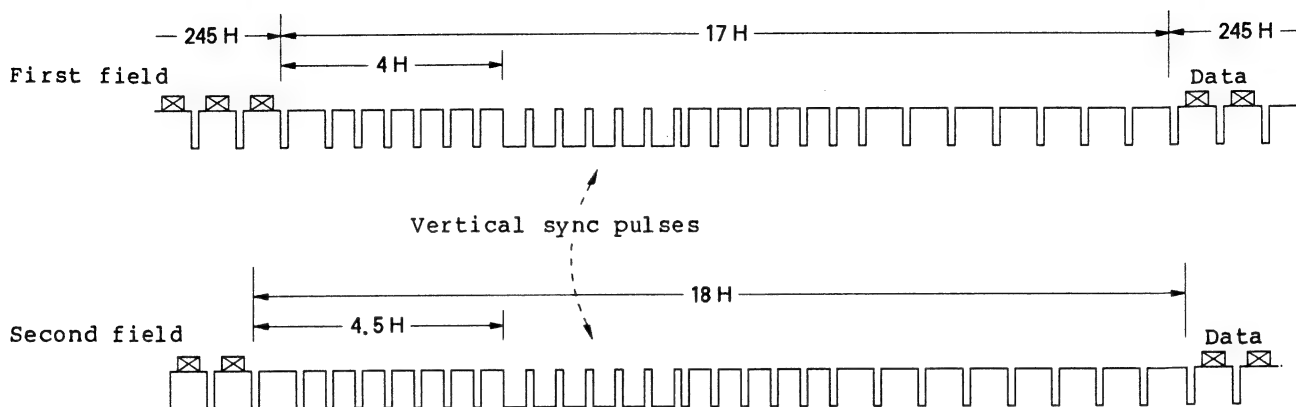
DA IN selector: INT/EXT

EMP switch (on the AD-23 board): ON/OFF

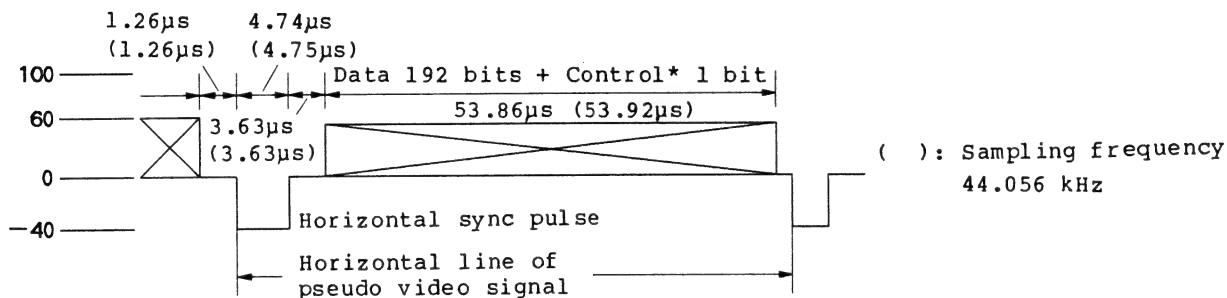
1-10. SIGNAL FORMAT

1-10-1. Composite Digital (Video) Input/Output Signals

Data configuration



Composite digital (video) waveforms



* Control bit (the 129th bit)

1 field = 7 blocks

1 block = 35 H

• Emphasis (the 1st H of each block)

ON: Data "0" (black on a monitor TV)

OFF: Data "1" (white on a monitor TV)

• Sampling frequency (the 2nd H of each block)

44.1 kHz: Data "0" (black on a monitor TV)

44.056 kHz: Data "1" (white on a monitor TV)

• Mode (the 3rd H of each block)

SI format: Data "1" (white on a monitor TV)

EI format: Data "0" (black on a monitor TV)

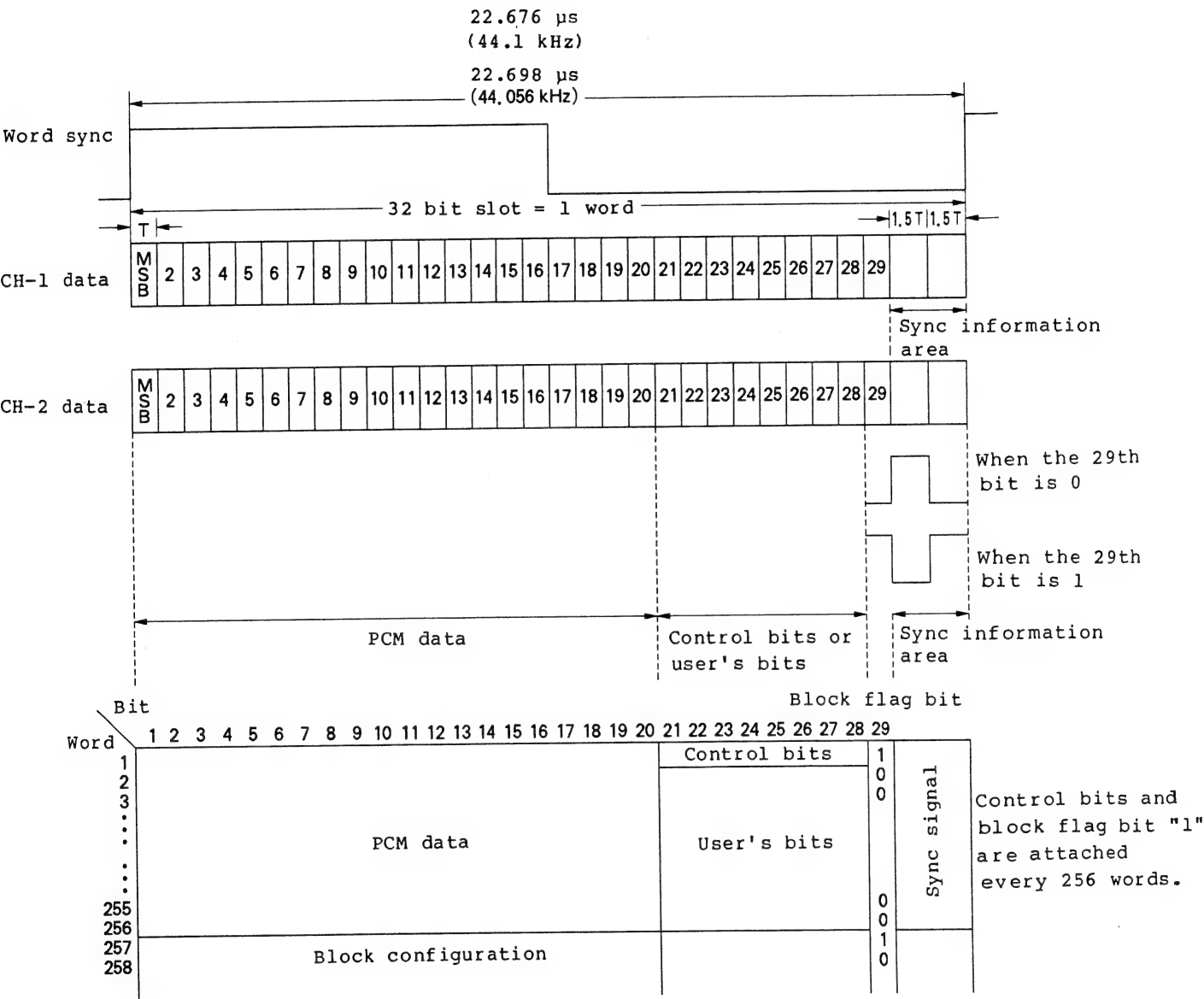
• Audio/code (the 4th H of each block)

Audio: Data "1" (white on a monitor TV)

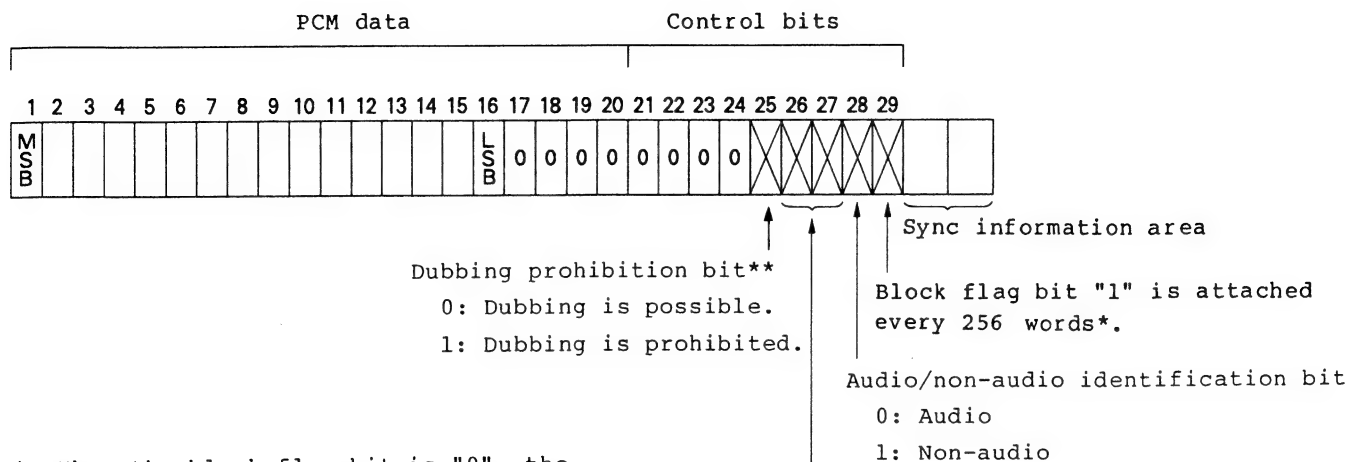
Code: Data "0" (black on a monitor TV)

1-10-2. Digital Input/Output and Control Signals

Digital input/output format



Control signal block structure



- * When the block flag bit is "0", the audio/non-audio identification bit, dubbing prohibition bit and emphasis identification bits are also "0".
- ** In the PCM-1630, the dubbing prohibition bit is always "0".

*** For interface (signal: DA IN CH-1) between the DAE-1100A with serial No. 10601 and higher and the PCM-1630 with serial No. 11301 and higher, the 26th bit is used independently as the EDIT signal bit. Therefore, only the 27th bit is used as the emphasis identification bit.

26th bit

0: Normal

1: Automatic editing

1-11. SYNCHRONIZATION

The capstan servo of the recorder for recording and playing back the digital audio signals must be locked to the sync signal of the PCM-1630. In addition, when a recording/playback system consisting of a PCM-1630 and a recorder is to be synchronized with other equipment (such as a VTR for recording/playing back video signals, or audio equipment), the system and equipment must be synchronized by means of an external sync signal. The following synchronization method is recommended:

1) When a PCM signal is directly supplied from the PCM-1630 to a recorder:

A sync signal from the COMPOSITE DIGITAL OUT connector or the COMPOSITE SYNC OUTPUT connector of the PCM-1630 is supplied to the recorder. (Refer to Figs. 1 and 2, (A).)

2) To synchronize systems including a PCM-1630 with each other, or to synchronize a system including a PCM-1630 with another system:

A sync signal can be supplied from an external sync generator or one PCM-1630. A sync signal or several kinds of sync signals which are locked to each other can be used in the system. It is recommended that the sync signal from the COMPOSITE SYNC OUTPUT connector or the WORD SYNC OUTPUT connector of one PCM-1630 be supplied as shown. (Refer to Figs. 1 and 2, (B) and (C).)

When both the composite sync signal and the word sync signal are supplied, the composite sync signal will have priority.

Sync signal priority

1. composite sync signal
2. word sync signal
3. DI sync signal (from the optional digital I/O board)

Fig. 1 Synchronization using an external composite sync signal

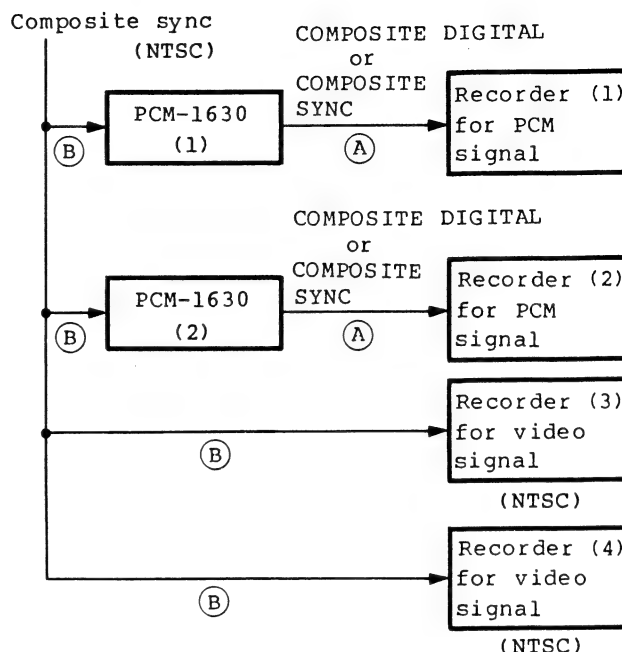
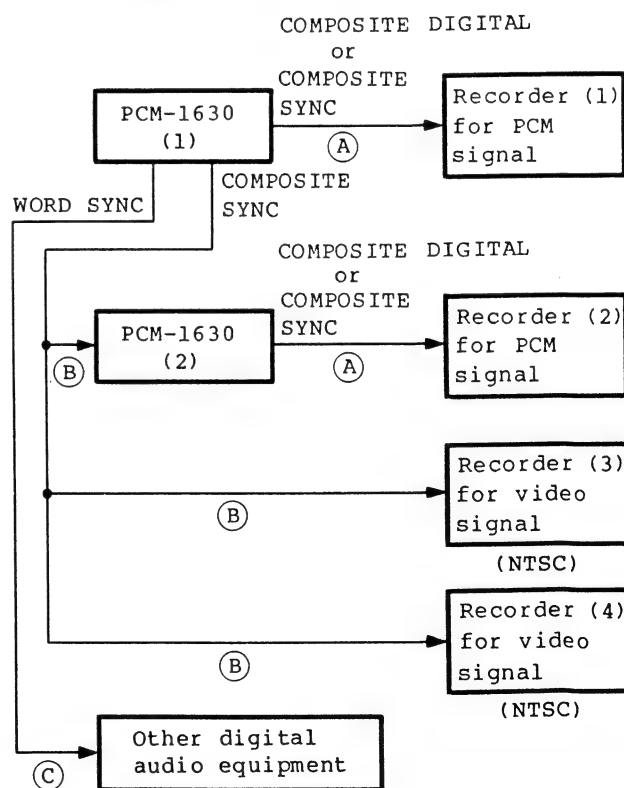


Fig. 2 Synchronization using the composite sync output signal and the word sync output signal from the PCM-1630 (1)



SECTION 1

FONCTIONNEMENT

Le PCM-1630 est un processeur audio numérique à destination professionnelle. Il est conçu à fonctionner avec un magnétoscope Sony BVU-800DA/800DB, un enregistreur numérique principal DMR-2000/4000 ou tout autre magnétoscope professionnel Sony pour créer un système d'enregistrement et de lecture PCM professionnel.

1-1. CARACTERISTIQUES

Enregistrement et lecture à hautes performances

Un système d'enregistrement et de lecture PCM, comportant le PCM-1630 et des magnétoscopes tels qu'un DMR-2000/4000 et un BVU-800DA/DB, atteint de hautes performances avec les caractéristiques suivantes:

Réponse de fréquence: 20 Hz à 20 kHz

+0,5 dB
-1,0

Plage dynamique: plus que 90 dB

Distorsion: moins que 0,05%

Pleurage et scintillement: inférieur au seuil mesurable

Copiage numérique sans détérioration

En raccordant l'appareil à deux magnétoscopes, un copiage numérique des sons est possible sans détérioration, grâce à la fonction de copiage numérique de cet appareil.

Synchronisation avec équipement vidéo

L'appareil peut être synchronisé au signal composite NTSC d'un magnétoscope.

Montage électronique

L'emploi de l'appareil avec un Editeur audio numérique DAE-1100/DAE-1100A et deux magnétoscopes permet, avec précision, le montage automatique et électronique d'un programme dont la qualité est supérieure à celle d'un montage par collage sur une bande analogique.

Circuit d'accentuation

Le rapport signal/bruit des hautes fréquences est amélioré par le circuit d'accentuation incorporé qui élève le niveau d'enregistrement et abaisse celui de lecture.

Structure de donnée sérielle et possibilité de changement

Une structure sérielle est adoptée comme format d'entrée/sortie numérique. Comme ce format peut être interchangé avec celui d'un système d'enregistrement et de lecture PCM en faisant appel à un processeur audio numérique Sony PCM-1610, une émission et une transmission directes des données numériques sont possibles entre cet appareil et le système PCM-1610. Par conséquent, des bandes enregistrées sur cet appareil peuvent être reproduites avec un PCM-1610 et vice versa.

Cet appareil peut aussi remplacer un PCM-1610 dans un système d'enregistrement et de lecture PCM à PCM-1610. (La différence essentielle entre ces deux appareils est que le PCM-1630 n'est pas doté, comme le PCM-1610, d'un générateur de code de temps.)

Choix entre deux taux d'échantillonnage

Pour l'enregistrement, on dispose d'un taux d'échantillonnage de 44,056 kHz (correspondant au système de télévision NTSC) et de 44,1 kHz (pour système à compact disc et audio numérique). En mode de synchronisation externe, l'appareil se synchronise automatiquement à l'une des deux fréquences par synchronisation avec un signal composite NTSC ou un signal de synchronisation à mots.

Réponse de phase linéaire

Pour améliorer la réponse de phase, des filtres de compensation sont incorporés dans la section A/N, tandis que, dans la section N/A sont prévus des filtres de sur-échantillonnage FIR (réponse d'impulsion finie).

Réglage facile d'un niveau de référence par indicateur de niveau

Un indicateur de niveau, doté d'une fonction de témoin de référence, fournit deux types d'informations qui facilitent le réglage précis des niveaux de lecture et d'enregistrement.

Deux paires d'entrées de signal (vidéo) numérique composite

Ces deux paires rendent possible le choix des signaux de lecture (vidéo) numériques composites, provenant de deux magnétoscopes.

Connecteur d'état

Fournissant les données d'erreur de bandes enregistrées en PCM, ce connecteur permet l'analyse de ces erreurs quand on fait appel à un Analyseur de bande numérique DTA-2000.

Consommation réduite

Les circuits à haute intégration de conception nouvelle, incorporés au circuit logique, réduisent la consommation et ont rendu possible l'adoption d'une alimentation linéaire.

Plaquettes de circuits imprimés en option

Un élargissement des fonctions est possible par des plaquettes de circuits imprimés, disponibles comme options.

● Fonction RAR (Lecture après lecture)

La lecture atteint une extrême fiabilité si l'appareil, où est installée une plaquette RAR (DABK-1630) en option, est utilisé avec un enregistreur audio numérique disposant d'une fonction lecture-après-lecture (tel que le Sony DMR-4000). En outre, quand la plaquette RAR est installée, une fonction lecture-après-écriture est utilisable avec cet appareil pour le copiage et le montage.

● Interface E/S numérique

Quand les plaquettes E/S numériques (DABK-1631) en option sont installées, les connecteurs d'entrée/sortie analogique fournissent des données d'entrée/sortie numériques, conformes aux normes AES/EBU.

1-2. SPECIFICATIONS

Nombre de canaux 2

Système de modulation

Système PCM,
conforme au signal de
télévision NTSC

Fréquence d'échantillonnage

44,1 kHz ou 44,056 kHz

Taux de transfert

3,5831 Mbit/sec. ou
3,5795 Mbit/sec.

Structure de code

Equivalent à 6 mots
en 1 H du signal TV
NTSC

Quantification

En 16 bits linéaires

Plage dynamique

Plus que 90 dB

Distorsion harmonique

Moins que 0,05%
(au niveau d'entrée
de référence)

Pleurage et scintillement

Inférieur au seuil
mesurable

Réponse de fréquence

20 Hz à 20 kHz $+0,5$ dB
 $-1,0$

Durée du retard du signal

DIGITAL IN (ENC IN) à
DIGITAL OUT (DEC OUT):
env. 9,7 msec.
ANALOG IN à ANALOG OUT:
env. 10,5 msec.
(augmente de 4,8 msec. en
mode RAR)

Entrées analogiques

ANALOG INPUT CH-1 (D-
I)/CH-2:

Type Cannon XLR-3-31

40 kohms symétrique/20 kohms asymétrique	Entrées de synchronisation composite
Niveau entrée de référence: +4 dBs (à +14 dEs)	COMPOSITE SYNC INPUT
Niveau d'entrée maxi: +24 dBs	1/2: type BNC-R,
(0 dBs = 0,775 V rms)	75 ohms asymétrique,
	4 Vc-c, sync
Sorties analogiques	composite négative
ANALOG OUTPUT CH-1 (D-0)/CH-2:	Sorties de synchronisation composite
Type Cannon XLR-3-32, symétrique/asymétrique,	COMPOSITE SYNC OUTPUT
Moins que 50 ohms	1/2: type BNC-R,
(charge admissible 600 ohms)	75 ohms asymétrique,
Niveau de sortie de référence: +4 dBs (à +14 dBs)	4 Vc-c, sync
Niveau de sortie maxi: +24 dBs	composite négative
(0 dBs = 0,775 V rms)	Entrées numériques
Entrées (vidéo) numériques composites	DIGITAL I/O: type BNC-R,
COMPOSITE DIGITAL INPUT	compatible TTL,
A/B: type BNC-R	structure sérielle à
75 ohms asymétrique	32 cases
0,714 Vc-c (niveau de données 60 IRE) $\pm 20\%$	1,4112 Mbit/sec.
COMPOSITE DIGITAL A/B:	ou 1,4098 Mbit/sec.
Multi-connecteurs à 8 broches, 75 ohms asymétrique, 0,714 Vc-c (niveau de données 60 IRE) $\pm 20\%$	Sorties numériques
Sorties (vidéo) numériques composites	DIGITAL I/O: type BNC-R,
COMPOSITE DIGITAL OUTPUT 1/2: type BNC-R,	compatible TTL,
75 ohms asymétrique	structure sérielle à
0,714 Vc-c (niveau de données 60 IRE) $\pm 10\%$	32 cases
COMPOSITE DIGITAL A/B:	1,4112 Mbit/sec.
Multi-connecteurs à 8 broches, 75 ohms asymétrique, 0,714 Vc-c (Niveau de données 60 IRE) $\pm 10\%$	ou 1,4098 Mbit/sec.
	Entrée de synchronisation à mot
	WORD SYNC INPUT: type
	BNC-R, compatible TTL
	Plage de fréquence d'entrée:
	44,1 kHz + 5 Hz
	44,056 kHz + 5 Hz
	Sortie de synchronisation à mot
	WORD SYNC OUTPUT: type
	BNC-R, compatible TTL
	Sortie état
	STATUS: Connecteur de type D-sub 25
	broches, RS-422 et compatible TTL
	Sortie de casque
	HEADPHONES: prise téléphonique stéréo (8 ohms)
	Magnétoscopes utilisables
	Sony DMR-2000, DMR-4000, BVU-800DA/DB, BVU-200B, BVH-2000, BVH-1100, BVH-1100A

Système de montage recommandé

Pour montage de base:

PCM-1630 et deux
DMR-4000

Pour montage précis:

PCM-1630, DAE-1100,
ou DAE-1100A,
et deux DMR-2000,
deux DMR-4000,
deux BVU-800DB ou un
DMR-4000 et un autre
magnétoscope

Température d'utilisation

0°C à 40°C
(32°F à 104°F)

Température d'entreposage

-20°C à +60°C
(-4°F à +140°F)

Alimentation

Secteur 100/120/220/
240 V $\pm 10\%$, sélectable
50/60 Hz

Consommation

90 W

Dimensions hors tout

424 x 200 x 530 mm
(1/h/p)(16 3/4 x 7 7/8
x 20 7/8 pouces)

Poids

26 kg (57 livres 5
onces)

Accessoires fournis

Plaquette d'extension
EX-71 (1)
Adaptateur pour
montage en rack (1 jeu)
Câbles de raccordement
à connecteurs BNC (2)
Multi-câble VMC-3P à 8
broches (1)
Cordon d'alimentation
secteur (1)
Mode d'emploi et
d'entretien (1)

La conception et les spécifications
peuvent être changées sans préavis.

Accessoires en option

Plaquette de circuit RAR (RAR-1): DABK-1630

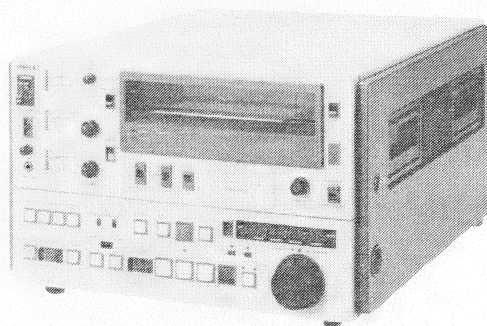
Plaquettes de circuit numérique E/S
(DI-5/DO-17): DABK-1631

Plaquettes de format EI (ENC-5/DEC-22/RAR-
2): DABK-1632

1-3. EQUIPEMENTS RECOMMANDES

Magnétocassette BVU-800DA/DB U-matic

Cet appareil peut fonctionner comme
enregistreur et lecteur dans divers
systèmes, tels qu'un d'enregistrement-
lecture avec un processeur audio numérique
PCM-1630, ou un système de montage avec un
éditeur audio numérique DAE-1100.
Grâce à cet appareil, le code de temps
SMPTE peut être enregistré sur la piste de
code de temps d'une bande ou lu à partir
de celle-ci. L'appareil dispose aussi d'un
asservissement de cabestan et de cadrage,
ainsi que d'un système de contrôle
logique.



Enregistreur numérique principal DMR-2000

Cet appareil est conçu pour fonctionner
avec le processeur audio numérique PCM-
1630 pour l'enregistrement et la lecture
de sons haute fidélité et de qualité
numérique. Lorsqu'un éditeur audio
numérique DAE-1100 est incorporé au
système, des montages numériques de haute
précision sont possibles pour la
réalisation de bandes maîtresses,
utilisables pour la production de compacts
discs.



Enregistreur numérique principal DMR-4000

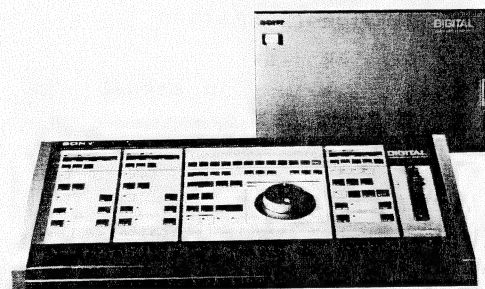
Conçu pour être utilisé avec des appareils de contrôle CD de la nouvelle génération, cet appareil offre les fonctions RAR (Lecture après lecture) et RAW (Lecture après écriture).

Lorsque le DMR-4000 est utilisé en combinaison avec le PCM-1630 et le DABK-1630, ces fonctions s'activent, ce qui assure au système un haut niveau d'efficacité.



Editeur audio numérique DAE-1100/DAE-1100A

Utilisé avec un processeur audio numérique PCM-1630 et un magnétoscope BVU-800DB ou DMR-2000/4000, cet appareil permet un montage audio numérique à numérique tout automatique de haute précision. Il est également pourvu d'une bague de recherche accélérant l'accès au seuil de montage, d'une fonction de répétition du montage et d'une fonction de revue.



Analyseur de bande numérique DTA-2000

Il est destiné à fournir à une imprimante les données d'erreur de bandes enregistrées en PCM, en fonction des signaux d'état provenant d'un processeur audio numérique PCM-1630.

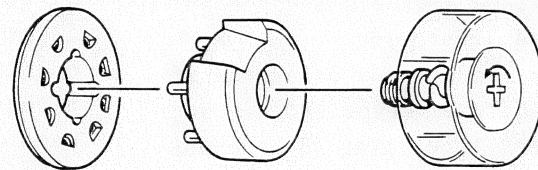


1-4. PRECAUTIONS

1-4-1. Alimentation

L'appareil peut fonctionner sur secteur de 100, 120, 220 ou 240 V. Afin de brancher celui-ci sur le secteur, prière de vérifier si la tension de fonctionnement réglée sur l'appareil est identique à celle du secteur local. Si le sélecteur de tension, implanté sur le panneau arrière, doit être réglé, procéder comme suit. Déposer le cache du sélecteur de tension à l'aide d'un tournevis et le replacer de manière que le chiffre de la tension correcte soit visible par l'encoche du sélecteur.

VOLTAGE SELECTOR
(Sélecteur de tension)



1-4-2. Ventilation

Une bonne aération est indispensable pour empêcher une élévation de la température interne. Installer, dès lors, l'appareil dans un endroit bien ventilé et, pour prolonger sa durée de vie et en obtenir un bon fonctionnement, ne pas boucher les orifices de ventilation.

1-4-3. Plage des températures de fonctionnement

Ne pas installer l'appareil près de sources de chaleur, telles qu'un radiateur ou une bouche d'air chaud, ni en plein soleil. Pour garantir un fonctionnement correct, ne pas dépasser les températures suivantes:

Température de fonctionnement: De 0°C à 40°C (32°F à 104°F)

Températures où les performances sont assurées: De 5°C à 35°C (41°F à 95°F)

1-4-4. Durée de préchauffe de l'appareil

Laisser l'appareil sous tension pendant au moins 30 minutes avant son utilisation.

1-4-5. Entrées et sorties analogiques

Lorsque les connecteurs ANALOG INPUT et OUTPUT de l'appareil doivent être utilisés en une connexion asymétrique, veiller à raccorder la broche "froide" à la broche "masse". Si la broche "chaude" est raccordée à la "masse", un potentiel de courant continu risque de se produire et de perturber les caractéristiques.

1-4-6. Entrées et sorties numériques composites (vidéo)

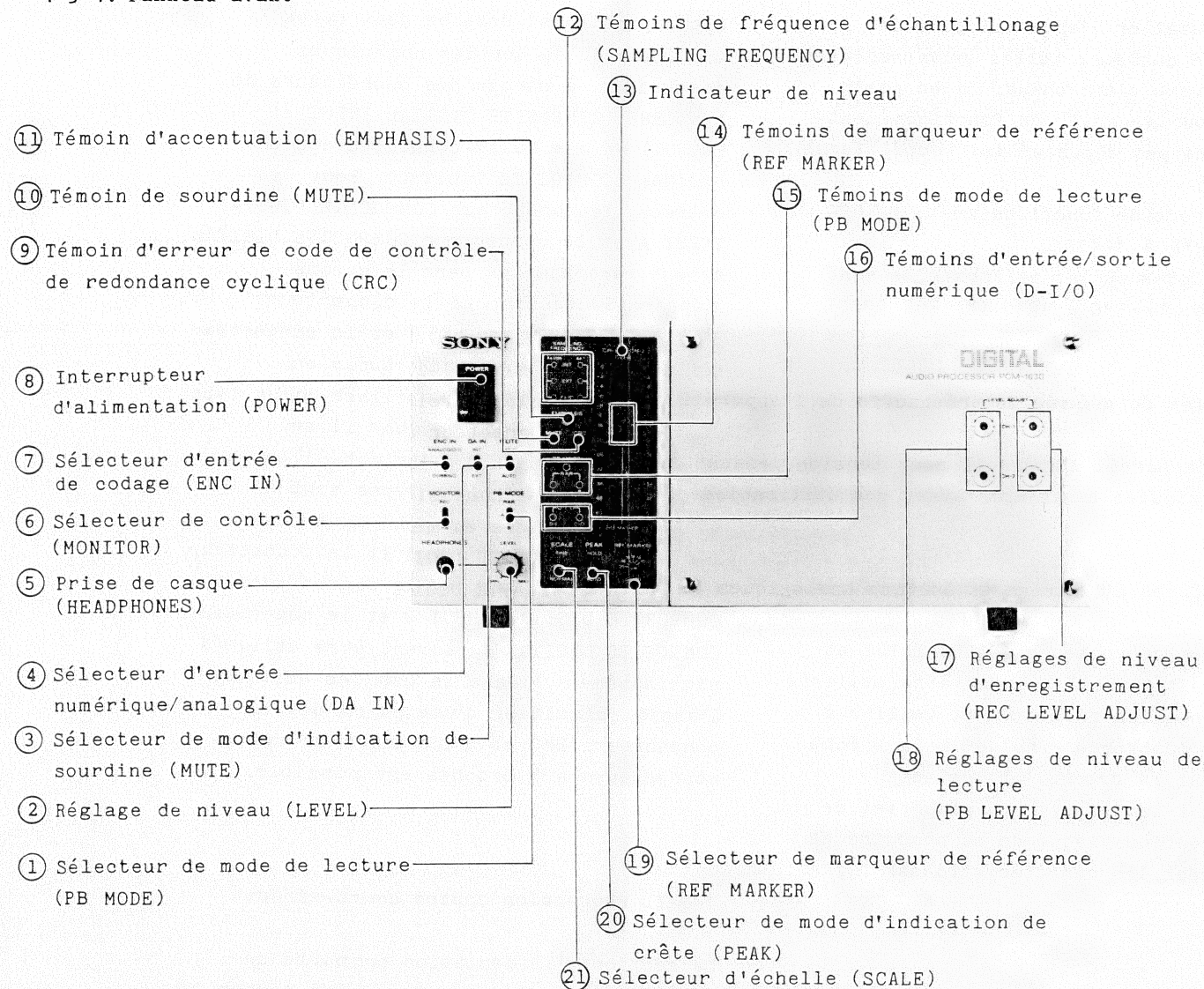
Cet appareil est doté de deux types d'entrées et de sorties numériques composites, à savoir des connecteurs de type BNC (COMPOSITE DIGITAL INPUT et OUTPUT) et des multi-connecteurs à 8 broches (COMPOSITE DIGITAL). Pour les entrées, le connecteur COMPOSITE DIGITAL INPUT A et le connecteur COMPOSITE DIGITAL A sont raccordés en parallèle dans l'appareil, tandis que le connecteur COMPOSITE DIGITAL INPUT B et le connecteur COMPOSITE DIGITAL B sont réunis en parallèle. Veiller à n'utiliser qu'un type de connecteur à la fois, car il se produira des interférences mutuelles sur les signaux si les deux types sont utilisés en même temps. (Le connecteur COMPOSITE DIGITAL INPUT A et le connecteur COMPOSITE DIGITAL B, ou le connecteur COMPOSITE DIGITAL INPUT B et le connecteur COMPOSITE DIGITAL A peuvent être utilisés simultanément.) Dans le cas des sorties, l'emploi simultané d'une paire de connecteurs BNC et d'une paire de multi-connecteurs à 8 broches est possible.

1-4-7. Protection contre court-circuit

La section d'alimentation comporte un système de protection, destiné à couper la tension de sortie lorsqu'un court-circuit se produit dans cette section. Lorsque ce circuit protecteur entre en service, l'alimentation doit être immédiatement coupée et l'on attendra au moins 30 secondes avant une remise sous tension. La tension de sortie sera alors rétablie à l'état normal.

1-5. EMBLACEMENT ET FONCTION DES ORGANES ET DES COMPOSANTS

1-5-1. Panneau avant



① **Sélectionneur de mode de lecture (PB MODE)**
Il sert à choisir les signaux de lecture, la position de ce sélecteur étant indiquée par allumage d'un des témoins PB MODE.

RAR: Lorsqu'une plaquette de circuit RAR-1 (DABK-1630) en option est installée dans l'appareil, la fonction RAR (lecture après lecture) entre en service quand les signaux sont entrés simultanément aux connecteurs COMPOSITE DIGITAL INPUT A et B ou aux connecteurs COMPOSITE DIGITAL A et B. Si une plaquette de circuit RAR-1 n'est pas installée, l'appareil fonctionne comme

quand ce sélecteur est réglé sur "A" (le témoin PB MODE "A" s'allume).
A: L'entrée numérique composite A (entrée au connecteur COMPOSITE DIGITAL INPUT A ou COMPOSITE DIGITAL A) est choisie comme signal de lecture. Quand une plaquette RAR-1 en option est installée et que la fonction RAW (lecture après écriture) de la plaquette doit être utilisée pour le copiage ou le montage, on choisira cette position. Pour les détails, consulter le mode d'emploi et d'entretien de la plaquette RAR-1.

B: L'entrée numérique composite B (entrée au connecteur COMPOSITE DIGITAL INPUT B ou COMPOSITE DIGITAL B) est choisie comme signal de lecture.

② **Réglage de niveau (LEVEL)**

Sert à ajuster le volume du casque.

③ **Sélectionneur de mode d'indication de sourdine (MUTE)**

HOLD: Dès que le circuit de sourdine est en service, le témoin MUTE s'allume et il reste allumé aussi longtemps que l'appareil est sous tension.

AUTO: Le témoin MUTE s'allume seulement quand le circuit de sourdine est en service.

④ **Sélectionneur d'entrée numérique-analogique (DA IN)**

Choisit le signal de source à envoyer au convertisseur N/A incorporé.

INT: Les signaux fournis aux connecteurs COMPOSITE DIGITAL INPUT (type BNC) ou aux connecteurs COMPOSITE DIGITAL (8 broches) sont choisis.

EXT: Les signaux fournis aux connecteurs DA IN (dans la section de connecteur DIGITAL I/O) sont choisis.

⑤ **Prise de casque (HEADPHONES)**(prise téléphonique stéréo)

Pour le branchement d'un casque stéréo d'une impédance de 8 ohms.

⑥ **Sélectionneur de contrôle (MONITOR)**

REC: Choisit les signaux audio à enregistrer pour le contrôle et l'indication de niveau.

PB: Choisit les signaux de lecture audio pour le contrôle et l'indication de niveau.

⑦ **Sélectionneur d'entrée de codage (ENC IN)**

Il choisit un signal de source pour l'encodeur incorporé.

ANALOG (D-I): Choisit l'entrée des signaux aux connecteurs ANALOG INPUT.

DIGITAL: Choisit l'entrée des signaux aux connecteurs ENC IN (dans la section de connecteur DIGITAL I/O).

DUBBING: Choisit l'entrée des signaux aux connecteurs COMPOSITE DIGITAL INPUT ou COMPOSITE DIGITAL.

⑧ **Interrupteur d'alimentation (POWER)**

Il permet la mise sous/hors circuit.

⑨ **Témoin d'erreur de code de contrôle de redondance cyclique (CRC)**

Il s'allume quand l'appareil détecte une erreur CRC dans le signal de lecture.

⑩ **Témoin de sourdine (MUTE)**

Il s'allume quand le circuit de sourdine entre en service, d'après le réglage du sélecteur de mode d'indication MUTE.

⑪ **Témoin d'accentuation (EMPHASIS)**

Il s'allume quand la donnée d'entrée contient un signal pré-accrété et que le circuit adhoc de l'appareil entre en service pour désaccréter le signal pré-accrété qu'il a détecté.

⑫ **Témoins de fréquence d'échantillonnage (SAMPLING FREQUENCY)**

Un de ces témoins s'allume, d'après la fréquence d'échantillonnage (44,056 ou 44,1 kHz) du signal de synchronisation interne (INT), du signal de synchronisation externe (EXT) ou du signal de la bande en cours de lecture (FSID).

⑬ **Indicateur de niveau**

Les témoins de cet indicateur s'allument pour illustrer le niveau d'entrée de chaque canal pendant l'enregistrement, ou le niveau d'enregistrement au cours de la lecture, selon le réglage du sélecteur MONITOR et du sélecteur de mode d'indication PEAK.

Pour la facilité et la précision de la lecture, l'échelle de cet indicateur peut être élargie à l'aide du sélecteur SCALE.

Les témoins de niveau OVER dans le haut de l'indicateur de chaque canal s'allument pour signaler la présence d'une surcharge à l'enregistrement.

⑭ Témoins de marqueur de référence (REF MARKER)

Le témoin correspondant au niveau de référence (-10 dB à -20 dB), réglé par le sélecteur REF MARKER s'allume de sorte qu'il soit possible d'ajuster aisément le niveau d'entrée du signal de référence.

⑮ Témoins de mode de lecture (PB MODE)

Ils s'allument d'après le réglage (RAR, A ou B) du sélecteur PB MODE.

Le témoin A s'allume également quand le sélecteur PB MODE est réglé sur RAR, sans qu'une plaquette RAR-1, disponible en option, soit installée dans l'appareil.

⑯ Témoins d'entrée/sortie numérique (D-I/O)

Le témoin D-I ou D-O s'allume selon que la plaquette d'entrée ou de sortie numérique est installée.

D-I: S'allume quand une plaquette DI-5 en option est installée dans l'appareil au lieu de la plaquette AD-23.

D-O: S'allume quand une plaquette DO-17 en option est installée dans l'appareil au lieu de la plaquette DA-15.

⑰ Réglages de niveau d'enregistrement (REC LEVEL ADJUST)

Ils permettent, dans une plage d'environ 12 dB, un ajustement du niveau d'enregistrement. Une rotation dans le sens des aiguilles élève le gain du signal.

⑱ Réglages de niveau de lecture (PB LEVEL ADJUST)

Ils permettent, dans une plage d'environ 12 dB, un ajustement du signal de lecture. Une rotation dans le sens des aiguilles élève le niveau de la lecture.

⑲ Sélecteur de marqueur de référence (REF MARKER)

Il permet d'ajuster le niveau du signal de référence dans une plage de -10 dB à -20 dB par paliers de 2 dB. Le niveau de référence choisi est illustré par allumage du témoin REF MARKER correspondant.

⑳ Sélecteur de mode d'indication de crête (PEAK)

Il choisit la manière d'afficher crêtes sur l'indicateur de niveau. Ce sélecteur agit quand l'interrupteur PEAK HOLD (SW1) de la plaquette MT-16 est réglé sur ON. **HOLD:** L'indicateur affiche le niveau de la crête la plus élevée tout en suivant simultanément le niveau des crêtes transitoires, inférieures à la plus haute. Le niveau de crête restera affiché sur l'échelle jusqu'à ce qu'il soit remplacé par un plus élevé qui reste alors affiché à son tour.

AUTO: Les crêtes successives sont maintenues sur l'échelle pendant 1,5 sec. environ, sauf si une plus élevée se produit avant ce délai, auquel cas celle-ci est immédiatement affichée. (Lorsque le sélecteur de mode (SW4) de la plaquette MT-16 est réglé sur ON, les crêtes sont maintenues pendant 4 secondes environ.) Quand l'interrupteur PEAK HOLD de la plaquette MT-16 est réglé sur OFF, l'indicateur de niveau fait office d'indicateur de crête.

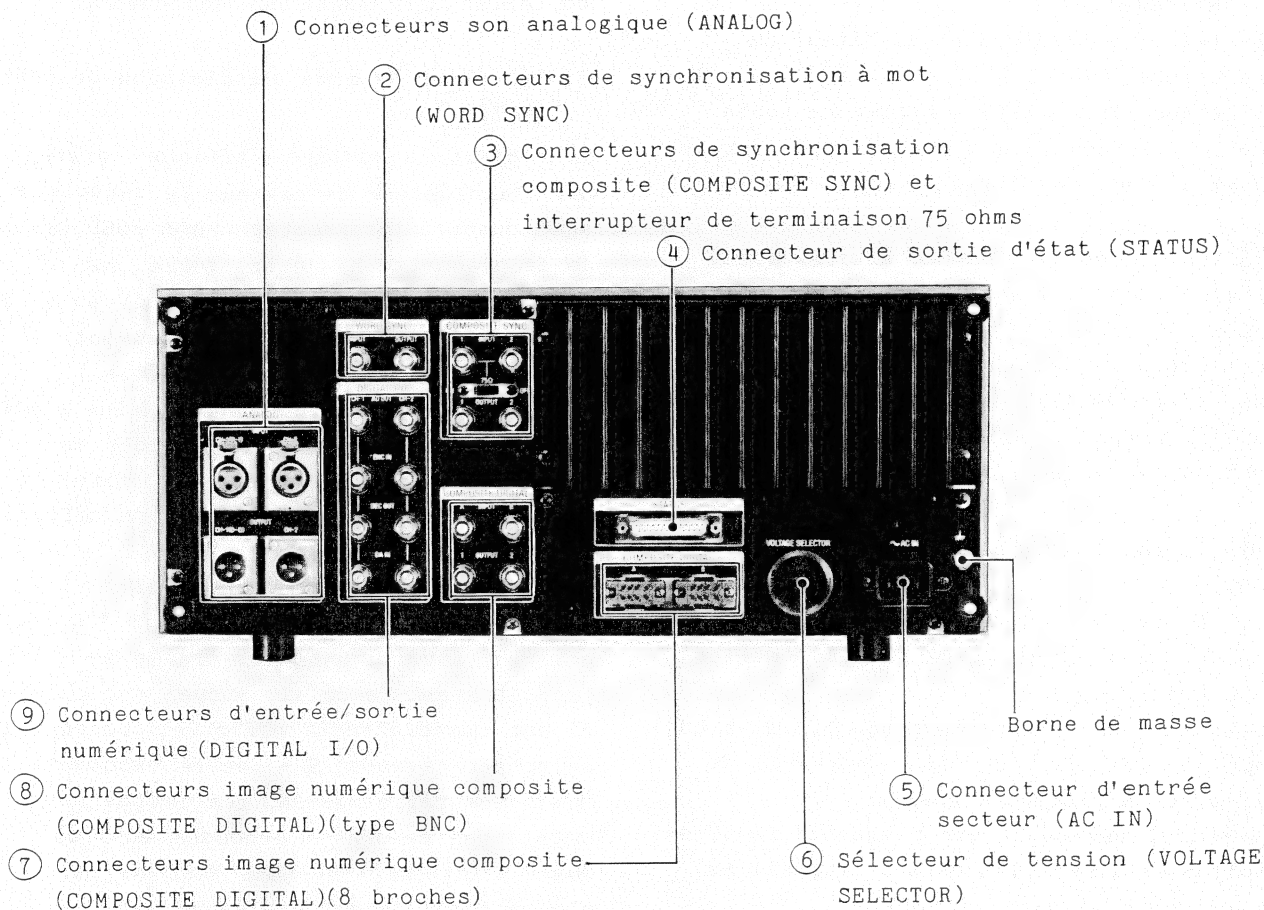
㉑ Sélecteur d'échelle (SCALE)

Il permet de choisir l'échelle de l'indicateur de niveau.

FINE: L'échelle de l'indicateur de niveau est élargie et le niveau du signal est affiché par paliers de 0,2 dB. Si le niveau du signal dépasse le niveau maximum de l'échelle élargie, la diode LED de 0 dB clignote; si le niveau est inférieur au niveau minimum, c'est la diode LED -60 dB qui clignote.

NORMAL: L'échelle de l'indicateur de niveau est celle qui est affichée sur le panneau avant.

1-5-2. Panneau des connecteurs



① Connecteurs de son analogique

(ANALOG)(équivalents au type Cannon XLR)

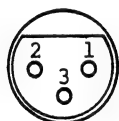
Les signaux audio analogiques sont entrés ou sortis par ces connecteurs.

Lorsque les plaquettes numériques E/S DABK-1630 en option sont installées, au lieu des plaquettes AD-23 et DA-15 pour équiper l'appareil d'un interface numérique conforme aux normes AES/EBU, on fournira un signal d'entrée numérique au connecteur INPUT CH-1 (D-I). Le signal de sortie numérique de l'appareil est fourni par le connecteur OUTPUT CH-1 (D-O).

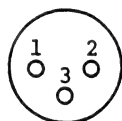
Ordonnancement des broches des connecteurs INPUT et OUTPUT

Pour modèles disponibles aux USA, Canada et Japon	Pour modèles disponibles dans les pays européens
1. Masse 2. Froid 3. Chaud	1. Masse 2. Chaud 3. Froid

INPUT



OUTPUT



② Connecteurs de synchronisation à mot

(WORD SYNC)(type BNC)

Un signal de synchronisation à mot de 44,1 kHz ou de 44,056 kHz est entré au connecteur WORD SYNC INPUT ou est issu du connecteur WORD SYNC OUTPUT.

③ Connecteurs de synchronisation composite

(COMPOSITE SYNC) (type BNC) et

interrupteur de terminaison 75 ohms

Il s'agit des connecteurs d'entrée (COMPOSITE SYNC INPUT 1, 2) et de sortie (COMPOSITE SYNC OUTPUT 1, 2) pour le signal de synchronisation composite. Pour boucler les connecteurs INPUT à 75 ohms, régler l'interrupteur de terminaison 75 ohms sur ON. Le régler sur OFF pour créer une sortie bouclée (connexion en pont).

④ Connecteur de sortie d'état (STATUS)

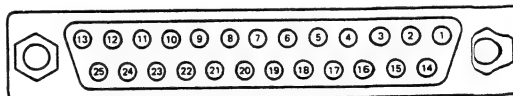
(type D-sub à 25 broches)

Les signaux comportant les informations d'état, telles que les drapeaux d'erreur, sont fournis à partir de ce connecteur. Les circuits de sortie de ce connecteur, à l'exception des circuits RS-422, ont des collecteurs ouverts.

Ordonnancement des broches

N° broche	Signal	Remarques
1	GND	Masse pour A/ \overline{B}
2	A/ \overline{B}	Sélection A/ \overline{B}
3	\overline{REC}/PB	
4	FG	Masse de bâti
5	\overline{HLD}	Maintien
6	GND	Masse pour \overline{HLD}
7	GND	Masse pour \overline{PAR}
8	---	N. C.
9	\overline{AVE}	Moyenne
10	GND	Masse pour \overline{AVE}
11	\overline{CRC}	Erreur CRC
12	GND	Masse pour \overline{CRC}
13	FsID	44,056 kHz: 'H' 44,1 kHz: 'L'
14	EMP	Accentuation ON: 'H'
15	GND	Masse pour \overline{MUTE}
16	\overline{MUTE}	Sourdine
17	\overline{WCLK}	} Horloge mot-clé
18	WCLK	
19	BCLK	} Horloge bit
20	\overline{BCLK}	
21	ME CH-1	} Donnée CH-1
22	$\overline{ME CH-1}$	
23	ME CH-2	} Donnée CH-2
24	$\overline{ME CH-2}$	
25	\overline{PAR}	Erreur de parité

RS-422



⑤ Connecteur d'entrée secteur (~AC IN)

Raccorder à une prise secteur à l'aide du cordon d'alimentation secteur fourni.

⑥ **Sélecteur de tension (VOLTAGE SELECTOR)**

Ce sélecteur permet de régler la tension de fonctionnement de l'appareil sur 100, 120, 220 ou 240 V. Pour modifier le réglage de ce sélecteur, consulter le paragraphe 1-4-1.

⑦ **Connecteurs image numérique composite (COMPOSITE DIGITAL)**(multi-connecteurs à 8 broches)

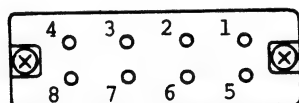
COMPOSITE DIGITAL A: Entrée numérique composite principale (raccordée en parallèle avec le connecteur COMPOSITE DIGITAL INPUT A ⑧ à l'intérieur) et sortie numérique composite.

COMPOSITE DIGITAL B: Entrée numérique composite auxiliaire (raccordée en parallèle avec le connecteur COMPOSITE DIGITAL INPUT B ⑧ à l'intérieur) et la sortie numérique composite.

Ordonnancement des broches

N° broche	Signal	Remarques
1	---	N. C.
2	C. D. IN	Entrée numérique composite
3	GND	Masse pour C. D. OUT
4	C. D. OUT	Sortie numérique composite
5	---	N. C.
6	GND	Masse pour C. D. IN
7	$\overline{\text{SEL}}$	Connecter à la masse
8	---	N. C.

Remarque: " $\overline{\text{SEL}}$ " est un signal pour le magnétoscope principal numérique DMR-2000.



⑧ **Connecteurs image numérique composite (COMPOSITE DIGITAL)** (type BNC)

COMPOSITE DIGITAL INPUT A: Entrée numérique composite principale.

COMPOSITE DIGITAL INPUT B: Entrée numérique composite auxiliaire.

COMPOSITE DIGITAL OUTPUT 1 et 2: Sorties numériques composites indépendantes.

⑨ **Connecteurs d'entrée/sortie numérique (DIGITAL I/O)** (type BNC)

AD OUT (sortie analogique à numérique): Les signaux A/N convertis sont sortis par ces connecteurs.

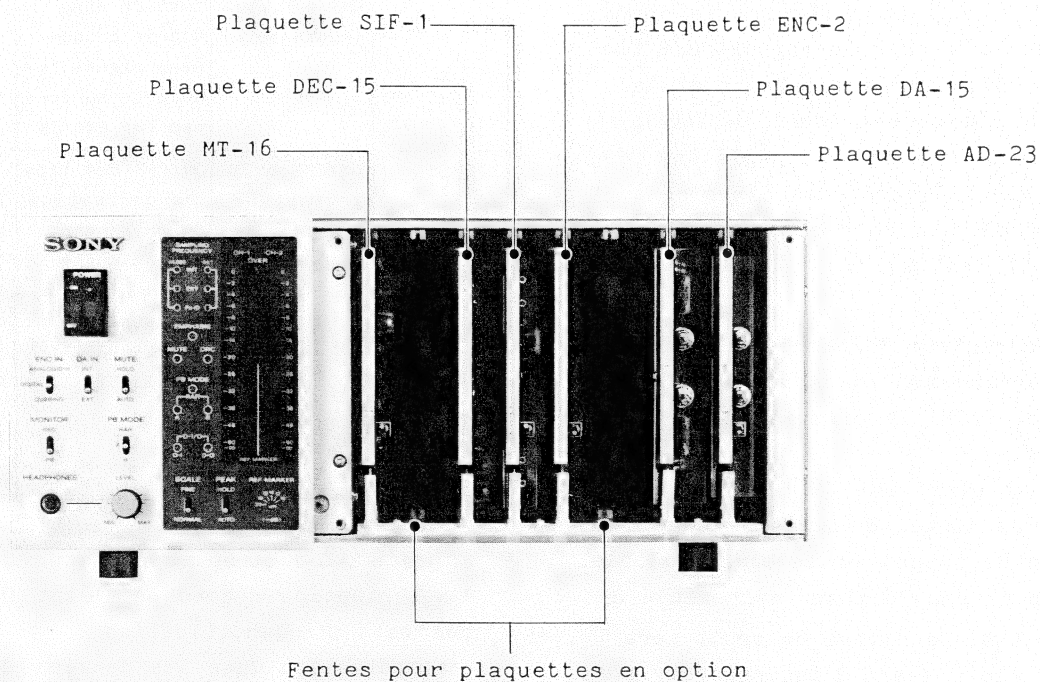
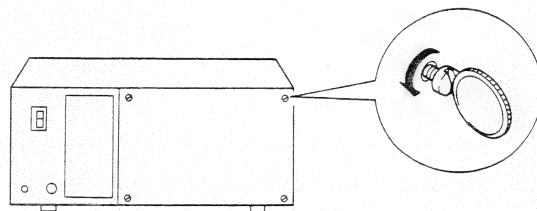
ENC IN (entrée codeur): Les signaux d'entrée au codeur incorporé sont fournis à ces connecteurs.

DEC OUT (sortie décodeur): Les signaux provenant du décodeur incorporé sont sortis à partir de ces connecteurs.

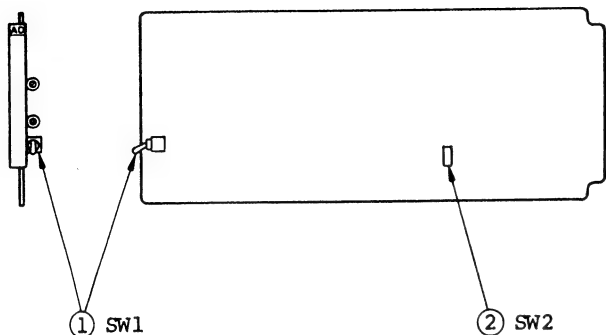
DA IN (entrée numérique à analogique): Les signaux numériques à convertir en N/A sont fournis à ces connecteurs.

1-5-3. Plaquettes de circuit imprimé

Les plaquettes de circuit imprimé s'installent derrière le panneau avant droit. Pour ajuster les réglages et interrupteurs des plaquettes de circuit imprimé, enlever le panneau avant droit en déposant les quatre vis à l'aide d'une pièce de monnaie ou d'un grand tournevis.



Plaque AD-23



① SW1: Interrupteur d'accentuation (EMP)
 Cet interrupteur met en service (ON) ou hors service (OFF) le circuit d'accentuation au cours de l'enregistrement.
 Lorsqu'il est placé sur ON, la réponse des hautes fréquences est automatiquement accentuée pendant l'enregistrement (pré-accentuation, avec constante de temps de 50 µsec./15 µsec.) pour réduire le degré de bruit et améliorer le rapport S/B (le degré d'accentuation est détecté et la réponse est abaissée pendant la lecture). Quand cet interrupteur est réglé sur OFF, la réponse de fréquence est linéaire à l'enregistrement. L'interrupteur EMP est réglé sur OFF en usine.

② SW2: Interrupteur "dither"
 Cet interrupteur met en service (ON) ou hors service (OFF) le circuit générateur de "dither".
 Lorsqu'il est placé sur ON, le "dither" est mixé à un signal d'entrée de bas niveau afin de supprimer le bruit audible. Bien que le niveau "dither" soit réglé à moins de 1 LSB, le niveau de bruit sera légèrement élevé quand l'interrupteur sera placé sur ON.
 Cet interrupteur est réglé sur OFF en usine.

Bits d'identification d'accentuation

Le réglage de l'interrupteur EMP est sans effet sur les bits d'identification d'accentuation dans les données du signal de sortie quand le sélecteur ENC IN du panneau avant est réglé sur une position particulière, présentée dans le tableau suivant. Les relations existant entre le réglage du sélecteur ENC IN et les bits d'identification d'accentuation s'établissent comme suit.

Signal de sortie Sélecteur ENC IN	Connecteur AD OUT	Connecteur COMPOSITE DIGITAL OUTPUT	Connecteur DEC OUT
ANALOG	ON/OFF d'in- terrupteur EMP sur pla- quette AD	ON/OFF d'in- terrupteur EMP sur pla- quette AD	Sans signi- fication*
DIGITAL	ON/OFF d'in- terrupteur EMP sur pla- quette. AD	ON/OFF des bits d'accen- tuation dans entrée de don- nées signal nu- mérique au con- necteur ENC IN	Sans signi- fication*
DUBBING	ON/OFF d'in- terrupteur EMP sur la plaquette AD	ON/OFF des bits d'accentuation dans les don- nées signal fourni au con- necteur COM- POSITE DIGI- TAL INPUT	ON/OFF des bits d'accen- tuation dans données signal au connecteur COMPOSITE DIGITAL INPUT

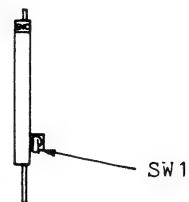
* En mode E-à-E ou en mode lecture, l'accentuation dépend de l'état ON/OFF des bits d'indentification d'accentuation dans les données de signal entrées au(x) connecteur(s) COMPOSITE DIGITAL INPUT.

Le circuit de désaccentuation pour la lecture est en service (ON) ou hors service (OFF) d'après le réglage du sélecteur DA IN, comme indiqué ci-dessous.

Sélecteur DA IN	Etat marche/arrêt (ON/OFF) de désaccentuation*
INT	Etat ON/OFF des bits d'identification d'accentuation dans l'entrée des données du signal au connecteur COMPOSITE DIGITAL INPUT.
EXT	Etat ON/OFF des bits d'identification d'accentuation dans l'entrée des données du signal aux connecteurs DA IN dans la section des connecteurs DIGITAL I/O.

* L'indicateur EMPHASIS du panneau avant s'allume ou s'éteint selon l'état ON/OFF du circuit de désaccentuation. La sortie du signal d'état d'accentuation provenant du connecteur STATUS du panneau arrière coïncide automatiquement à l'état ON/OFF du circuit de désaccentuation.

Plaquette ENC-2



SW1: Interrupteur de sourdine d'enregistrement (REC MUTE)

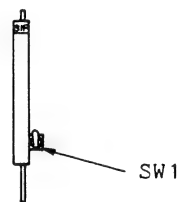
Pour enregistrer un signal de sourdine (le niveau de signal est réglé sur "0"), régler l'interrupteur sur ON.

Les signaux de sortie, provenant des connecteurs COMPOSITE DIGITAL OUTPUT ou COMPOSITE DIGITAL sont changés en signaux de sourdine.

Lors d'une utilisation normale, veiller à régler cet interrupteur sur OFF.

L'interrupteur est réglé sur OFF en usine.

Plaquette SIF-1



SW1: Sélecteur de fréquence d'échantillonnage (FS)

Cet interrupteur choisit la fréquence d'échantillonnage quand l'appareil fonctionne en mode de synchronisation interne:

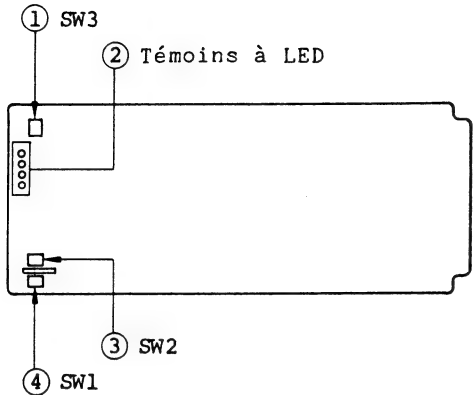
44,1 kHz (position relevée)

44,056 kHz (position abaissée)

La fréquence d'échantillonnage choisie est indiquée par l'indicateur INT SAMPLING FREQUENCY correspondant sur le panneau avant. Quand l'appareil fonctionne en mode de synchronisation externe, la fréquence d'échantillonnage est déterminée par la fréquence du signal de synchronisation externe, fourni à l'appareil. Par conséquent, le réglage de ce sélecteur est sans effet sur la fréquence d'échantillonnage.

Ce sélecteur est réglé sur 44,1 kHz en usine.

Plaque DEC-15



① SW3
Cet interrupteur DIP est prévu pour vérifier les fonctions de l'appareil. Cet interrupteur a été réglé comme suit en usine:

N° d'interrupteur			
1	2	3	4
ON	ON	OFF	OFF

Ne pas modifier le réglage des interrupteurs.

② Témoins à LED
Ils indiquent l'état des données en cours de reproduction. L'allumage de ces témoins indique:

- C (vert): Correction
- A (jaune): Moyenne
- H (rouge): Maintien
- P (rouge): Erreur de parité

③ SW2: Interrupteur de durée de sourdine/mise en/hors service de sourdine
Cet interrupteur DIP détermine si le circuit de sourdine est ou non en service quand se produit une erreur et il règle la durée d'actualisation du circuit de sourdine.

L'interrupteur N°4 met le circuit de sourdine en service (ON) ou hors service (OFF). Quand l'interrupteur N°4 est sur ON, les interrupteurs N°1 au N°3 déterminent la durée pendant laquelle agit le circuit de sourdine. Quand l'interrupteur N°4 est réglé sur OFF, le circuit de sourdine n'agit pas. La durée de la sourdine peut être déterminée comme suit par les interrupteurs N°1 à N°3 dans une plage allant de 1/60 seconde à 2 secondes environ.

N° d'interrupteur				Durée de sourdine
1	2	3	4	
x	x	x	OFF	Coupure de sourdine
OFF	OFF	OFF	ON	1/60 sec.
ON	OFF	OFF	ON	1/30 sec.
OFF	ON	OFF	ON	1/15 sec.
ON	ON	OFF	ON	Env. 0,1 sec.
OFF	OFF	ON	ON	Env. 0,3 sec.
ON	OFF	ON	ON	Env. 0,5 sec.
OFF	ON	ON	ON	Env. 1 sec.
ON	ON	ON	ON	Env. 2 sec.

x = position sans importance

Quand le circuit de sourdine est mis hors service (OFF), un léger bruit se produira si les signaux numériques composites, entrés aux connecteurs COMPOSITE DIGITAL ou COMPOSITE DIGITAL INPUT présentent des erreurs. Par conséquent, il est conseillé de ne pas couper (OFF) le circuit de sourdine au cours d'une exploitation normale.

L'interrupteur de durée de sourdine/mise en/hors service de sourdine est réglé comme suit en usine:

Circuit de sourdine: ON
Durée de sourdine: env. 1 sec.
(Interrupteur N°1: OFF, interrupteurs N°2 à N°4: ON)

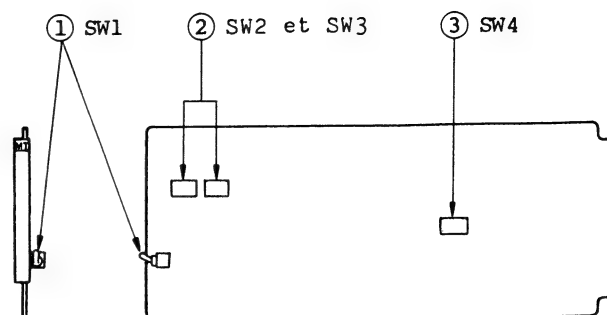
④ SW1: Interrupteur de sensibilité de sourdine (M-SENS)

Cet interrupteur DIP ajuste la sensibilité du circuit de sourdine, c.à.d. qu'il détermine la vitesse d'action de ce circuit quand se produisent des erreurs au cours de la reproduction d'une bande. Quand l'interrupteur N°1 seul est réglé sur ON, le circuit agit pour la durée déterminée par l'interrupteur de durée/mise en/hors service de sourdine (SW2) si des erreurs se produisent en succession pendant une période d'environ 20 H (TV H). Quand l'interrupteur N°2 seul est réglé sur ON, une succession d'erreurs d'environ 10 H met le circuit de sourdine en service. De même, quand seul l'interrupteur N°3 est réglé sur ON et que l'interrupteur N°4 seul est réglé sur ON, le circuit est mis en service dans le cas d'une succession d'erreurs des durées indiquées ci-après:

N° d'interrupteur				Succession des erreurs
1	2	3	4	
ON	OFF	OFF	OFF	20 H
OFF	ON	OFF	OFF	10 H
OFF	OFF	ON	OFF	5 H
OFF	OFF	OFF	ON	2 à 3 H

Quand un des interrupteurs ou tous sont réglés sur ON simultanément, une succession d'erreurs de la durée totale, déterminée par ces interrupteurs, met le circuit de sourdine en service. La sensibilité minimale est de 32 H et la maximale de 2 à 3 H. L'interrupteur de sensibilité de sourdine est réglé en usine à 20 H environ (interrupteur N°1 sur ON et interrupteurs N°2 à N°4 sur OFF).

Plaque MT-16



① SW1: Interrupteur de maintien de crête (PEAK HOLD)

Cet interrupteur choisit une fonction d'indicateur de maintien de crête ou d'indicateur de crête.

ON: L'indicateur de niveau affiche le maintien de crête. Le niveau de la crête la plus élevée est affiché et maintenu sur l'échelle pendant 1,5 sec. environ quand le sélecteur de mode d'indication PEAK du panneau avant est réglé sur AUTO, ou jusqu'à ce que se produise une crête plus élevée dans le cas où le même sélecteur est réglé sur HOLD. Cet interrupteur a été réglé sur ON en usine.

OFF: L'indicateur de niveau affiche les crêtes. Lorsque cet interrupteur est réglé sur OFF, le réglage du sélecteur de mode d'indication PEAK du panneau avant est sans effet sur l'affichage de l'indicateur de niveau et les niveaux de crête ne sont pas maintenus sur l'échelle, même si le sélecteur de mode d'indication PEAK est réglé sur HOLD.

② SW2 pour canal 1 et SW3 pour canal 2:
Interrupteurs de réglage d'indication de surcharge

Ces interrupteurs DIP déterminent le nombre de mots des signaux échelle totale (signaux de surcharge) entrés continuellement à l'appareil, et affichés avec le témoin de niveau OVER sur l'indicateur de niveau. Par ces interrupteurs, un maximum de 8 mots peuvent être déterminés pour chaque canal.

N° d'interrupteur								Nombre de mots
1	2	3	4	5	6	7	8	
ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	1
ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	2
ON	ON	ON	OFF	OFF	OFF	OFF	OFF	3
ON	ON	ON	ON	OFF	OFF	OFF	OFF	4
ON	ON	ON	ON	ON	OFF	OFF	OFF	5
ON	ON	ON	ON	ON	ON	OFF	OFF	6
ON	ON	ON	ON	ON	ON	ON	OFF	7
ON	ON	ON	ON	ON	ON	ON	ON	8

Ces interrupteurs sont réglés en usine sur 3 mots. (Les N° 1 à 3 sont réglés sur ON et les N° 4 à 8 sur OFF.)

③ SW4: Sélecteur de mode

Cet interrupteur DIP choisit les modes d'affichage d'indicateur de niveau. Il permet de régler la durée de maintien et le moment de libération de la crête et il détermine si l'indication de surcharge doit ou non être maintenue.

N° d'interrupteur	Mode d'indication	Position d'interrupteur	
		ON	OFF
1	Durée maintien crête	Environ 4 sec.	Environ 1,5 sec.
2	Durée libération	Environ 100 msec.	Environ 50 msec.
3	Niveau de surcharge	Pas maintenu	Maintenu
4 à 8	Non utilisé		

Tous les interrupteurs ont été réglés sur OFF en usine.

1-6. REGLAGE DU NIVEAU D'ENREGISTREMENT

1-6-1. Niveau du signal de référence et latitude

Par "latitude", on entend ici la différence entre le niveau du signal de référence et celui d'échelle totale. Cette latitude peut se régler dans une plage allant de 20 dB à 10 dB par paliers de 2 dB et elle est déterminée par la plage (env. 12 dB) des réglages REC LEVEL ADJUST. La plage de réglage de la latitude est la plus large quand le niveau du signal de référence est de +4 dBs (0 dBs = 0,775 Vrms). Le niveau d'entrée maximum est de +24 dBs. Etant donné que les réglages REC LEVEL ADJUST ne réduisent pas le gain, la latitude sera inférieure à 20 dB lorsque le niveau du signal de référence dépasse +4 dBs, tandis que la latitude sera supérieure à 10 dB quand le niveau du signal de référence est inférieur à +4 dBs.

On trouvera ci-après les niveaux du signal de référence et les plages correspondantes de réglage de la latitude.

Niveau du signal de référence	Plage de la latitude
-6 dBs	20 dB
-4 dBs	18 - 20 dB
-2 dBs	16 - 20 dB
0 dBs	14 - 20 dB
+2 dBs	12 - 20 dB
+4 dBs	10 - 20 dB
+6 dBs	10 - 18 dB
+8 dBs	10 - 16 dB
+10 dBs	10 - 14 dB
+12 dBs	10 - 12 dB
+14 dBs	10 dB

(0 dBs = 0,775 Vrms)

1-6-2. Indicateur de niveau

L'indicateur de niveau affiche en grandeur naturelle le niveau du signal A/N converti comme 0 dB. Par exemple, quand le niveau du signal de référence est +4 dBs et que la latitude est 20 dB, l'indicateur affiche "-20 dB" pour un signal de sortie de +4 dBs et "0 dB" pour un signal d'entrée de +24 dBs.

1-6-3. Réglage du niveau

Tout en observant l'indicateur de niveau, ajuster comme suit le niveau du signal. Veiller à placer sur AUTO le sélecteur de mode d'indication PEAK avant d'effectuer cet ajustement.

- 1 Déterminer la latitude par le sélecteur REF MARKER. La diode LED des REF MARKER correspondant à la latitude choisie s'allumera. Par exemple, pour régler la latitude à 16 dB, régler le sélecteur REF MARKER sur "16" et la diode REF MARKER de -16 dB s'allumera. Remarquer que le réglage du sélecteur est sans effet sur le gain et qu'il modifie uniquement l'indication REF MARKER.
- 2 Fournir le signal de référence à l'appareil et ajuster les réglages REC LEVEL ADJUST de sorte que s'allument les témoins de l'indicateur de niveau correspondant à la diode REF MARKER choisie.
- 3 Régler le sélecteur SCALE sur FINE et ajuster avec précision les réglages REC LEVEL ADJUST.
Le calibrage de l'indicateur de niveau change pour afficher par palier de 0,2 dB au-dessus et au-dessous de la diode REF MARKER allumée. Seule s'allume une diode LED pour chaque canal sur l'indicateur de niveau. Ajuster les réglages REC LEVEL ADJUST de sorte que l'indicateur de niveau corresponde au niveau REF MARKER allumé.
- 4 Régler le sélecteur SCALE sur NORMAL.

1-7. CONNEXIONS ET EXPLOITATION

1-7-1. Enregistrement et lecture

On trouvera ci-dessous un exemple des connexions de base, requises pour l'enregistrement et la lecture.

Connexion pour signal d'enregistrement:

Raccorder le connecteur COMPOSITE DIGITAL OUTPUT du PCM-1630 au connecteur d'entrée (vidéo) numérique composite de magnétoscopes, tels que les DMR-2000/4000, BVU-800DB (③).

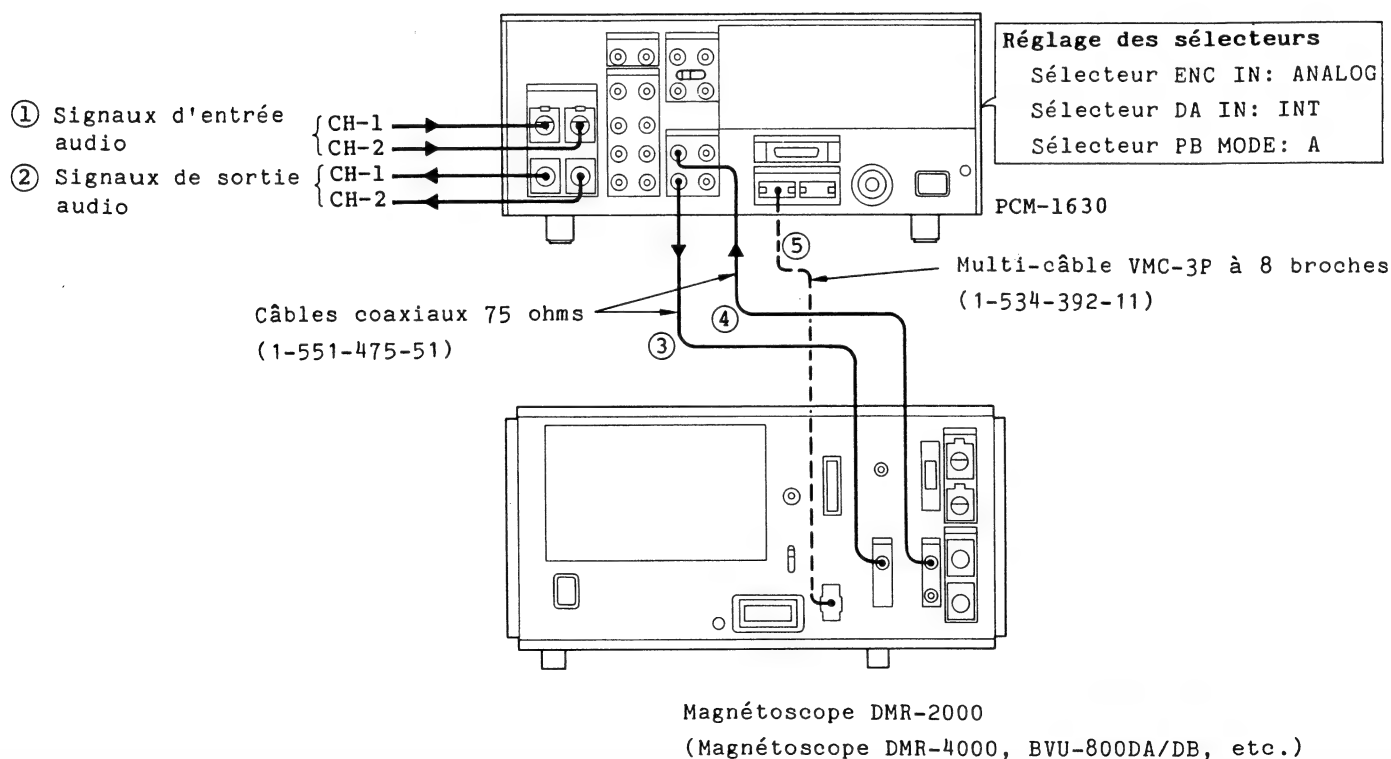
Connexion pour signal de lecture ou connexion pour contrôle en mode E-à-E:

Raccorder le connecteur de sortie (vidéo) numérique composite de l'enregistreur au connecteur COMPOSITE DIGITAL INPUT A du PCM-1630 (régler sur A le sélecteur PB MODE du PCM-1630) (④).

Lorsqu'un magnétoscope DMR-2000 ou DMR-4000 est incorporé au système, les connexions ③ et ④ peuvent être remplacées par une seule connexion par un multi-câble à 8 broches (⑤). Dans ce cas, **ne pas effectuer simultanément les connexions ④ et ⑤**.

Remarques

- Comme le servomécanisme du magnétoscope doit être verrouillé au signal de synchronisation provenant du PCM-1630 pendant la lecture, fournir un signal numérique composite ou un signal de synchronisation composite du PCM-1630 au magnétoscope.
- Les modes d'enregistrement et de lecture peuvent être alternés par poussées sur les touches adéquates du magnétoscope. A l'emploi du magnétoscope BVU-800DA/DB, régler toujours le circuit compensateur de chute du magnétoscope sur OFF et celui d'asservissement de cadrage sur ON.



1-7-2. Copiage numérique

En se servant de deux magnétoscopes (l'un destiné à la lecture et l'autre à l'enregistrement), reliés en un système, il est possible de copier une bande sans dégradation de sa qualité sonore.

Effectuer les connexions suivantes.

Connexion au lecteur: Pour raccorder le signal de lecture, effectuer la connexion ③ ci-après entre le PCM-1630 et le lecteur. Pour le branchement du signal de référence pour le dispositif d'asservissement, effectuer la connexion ② ou ⑥.

Connexion à l'enregistreur: Pour le branchement du signal d'enregistrement, raccorder le PCM-1630 et l'enregistreur comme illustré en ④. Pour la lecture après le copiage numérique, raccorder le connecteur COMPOSITE DIGITAL INPUT B du PCM-1630 au connecteur de sortie vidéo de l'enregistreur comme illustré en ⑤.

Copiage

Régler comme suit les sélecteurs du PCM-1630:

Sélecteur ENC IN: DUBBING

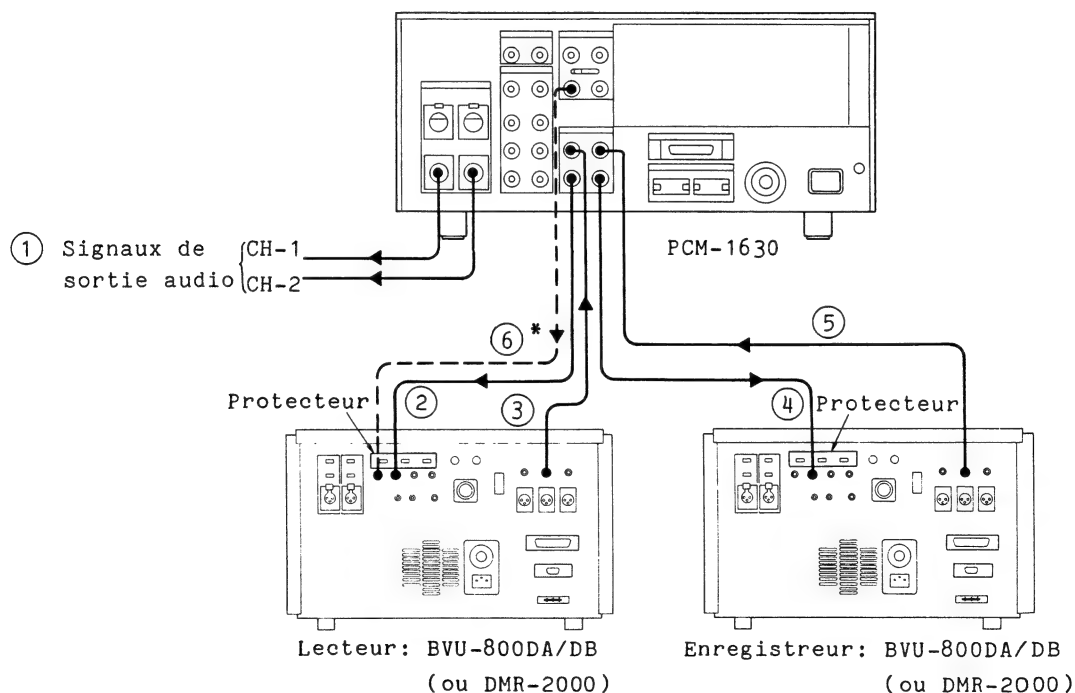
Sélecteur DA IN: INT

Sélecteur PB MODE: A

Régler le lecteur en mode de lecture et l'enregistreur en mode d'enregistrement et le copiage numérique s'accomplira.

Reproduction de la bande copiée

Pour reproduire la bande copiée, il suffit de placer le sélecteur PB MODE du PCM-1630 sur B sans modifier les connexions existantes. (Il est conseillé de placer le sélecteur ENC IN du PCM-1630 sur ANALOG ou DIGITAL.)



* La connexion ⑥ peut être effectuée à la place de la connexion ② qui est faite uniquement pour l'asservissement du cabestan du lecteur.

Remarques

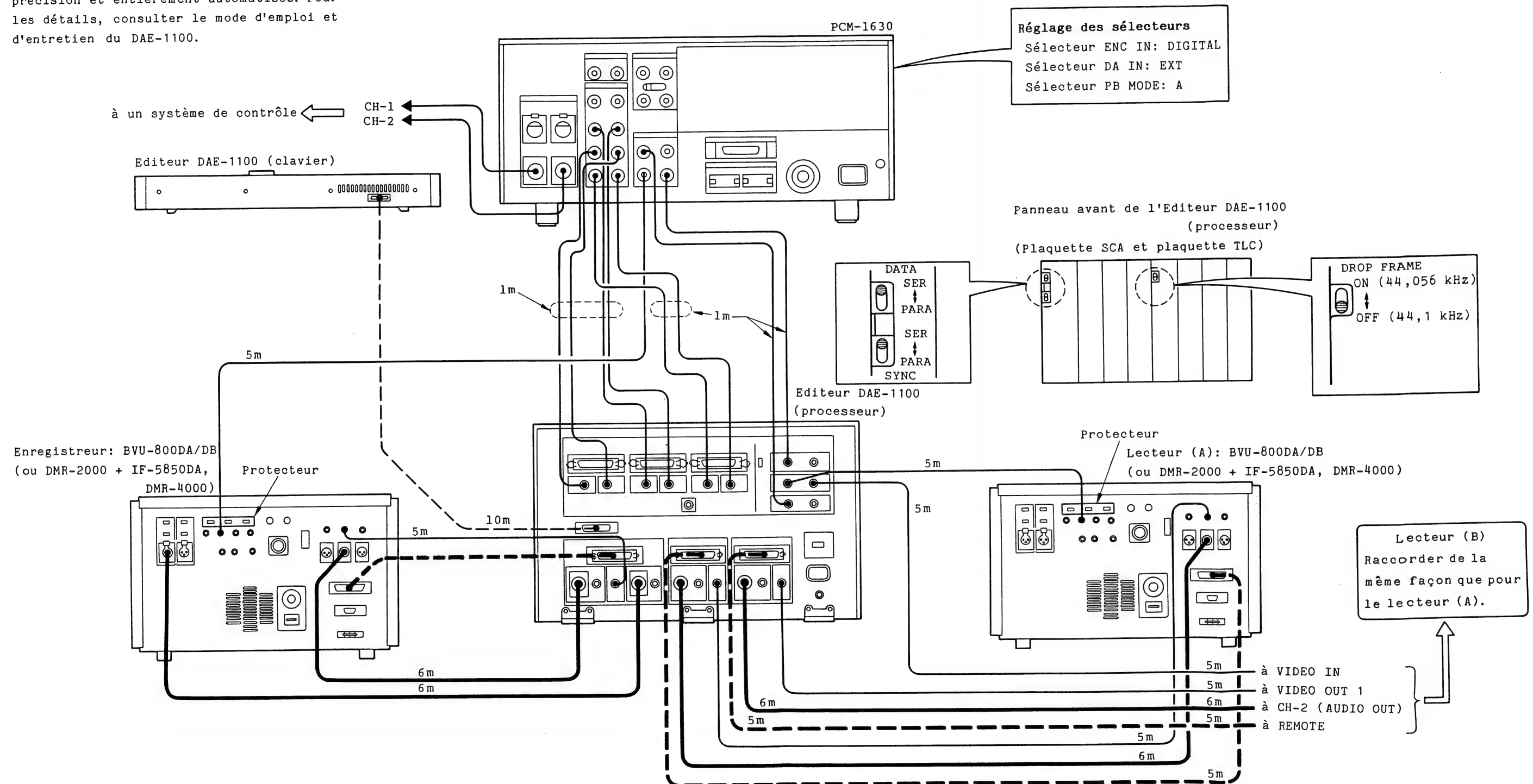
- Pour un copiage numérique, régler le sélecteur FS (SW1) de la plaquette SIF-1 du PCM-1630 à la position adéquate, en tenant compte de la fréquence d'échantillonnage (affichée par l'indicateur FsID du panneau avant du PCM-1630) de la bande du lecteur.
- Les bits d'identification d'accentuation de la bande reproduite sont enregistrés sur la bande de l'enregistreur. Le réglage de l'interrupteur EMP (SW1) sur la plaquette AD-23 du PCM-1630 est sans effet sur le copiage numérique.
- Quand l'enregistreur se trouve en mode E-à-E (mode d'arrêt) pendant un copiage numérique, la boucle du signal d'enregistrement et du signal de lecture peut faire osciller des bruits mais il ne s'agit pas d'une défaillance. Dans ce cas, réduire le niveau du volume pour éviter d'endommager les haut-parleurs.

1-7-3. Montage avec un Editeur audio numérique DAE-1100

En installant un Editeur audio numérique DAE-1100 dans le système, il devient possible de se livrer à des montages numérique à numérique rapides, de haute précision et entièrement automatisés. Pour les détails, consulter le mode d'emploi et d'entretien du DAE-1100.

Câbles de connexion

- — — 25 broches à 25 broches
- — — 36 broches à 36 broches
- — — Type Cannon XLR à type Cannon XLR
- — — Type BNC à type BNC



1-7-4. Montage avec un éditeur audio numérique DAE-1100A

Exemple de connexion

Le schéma présente un système de montage offrant la possibilité de mode de montage RAW avec un enregistreur numérique principal DMR-4000. Pour plus de détails, se reporter aux manuels de fonctionnement et d'entretien de l'appareil raccordé.

Câbles de connexion

- 25 broches à 25 broches
- 36 broches à 36 broches
- 8 broches à 8 broches
- ===== Type Cannon XLR à type Cannon XLR
- ===== Type BNC à type BNC

Réglage des sélecteurs

- Sélecteur ENC IN : DIGITAL
- Sélecteur MONITOR : PB
- Sélecteur DA IN : EXT
- Sélecteur PB MODE : A
- Interrupteur RAW (sur le DABK-1630 : EDT)

PCM 1630 + DABK-1630

DTA-2000

analyseur de bande numérique → à une imprimante

DAE-1100A (clavier)

Réglage des sélecteurs

- Sélecteur REMOTE/LOCAL : REMOTE
- Sélecteur REMOTE-1/REMOTE-2 : REMOTE-2 (36 BROCHES)
- Sélecteur AUX CH-2 : TIME CODE
- Sélecteur TIME CODE : REGEN
- Sélecteur RAW OUT : SUB

Enregistreur : DMR-4000

Boîtier d'interface

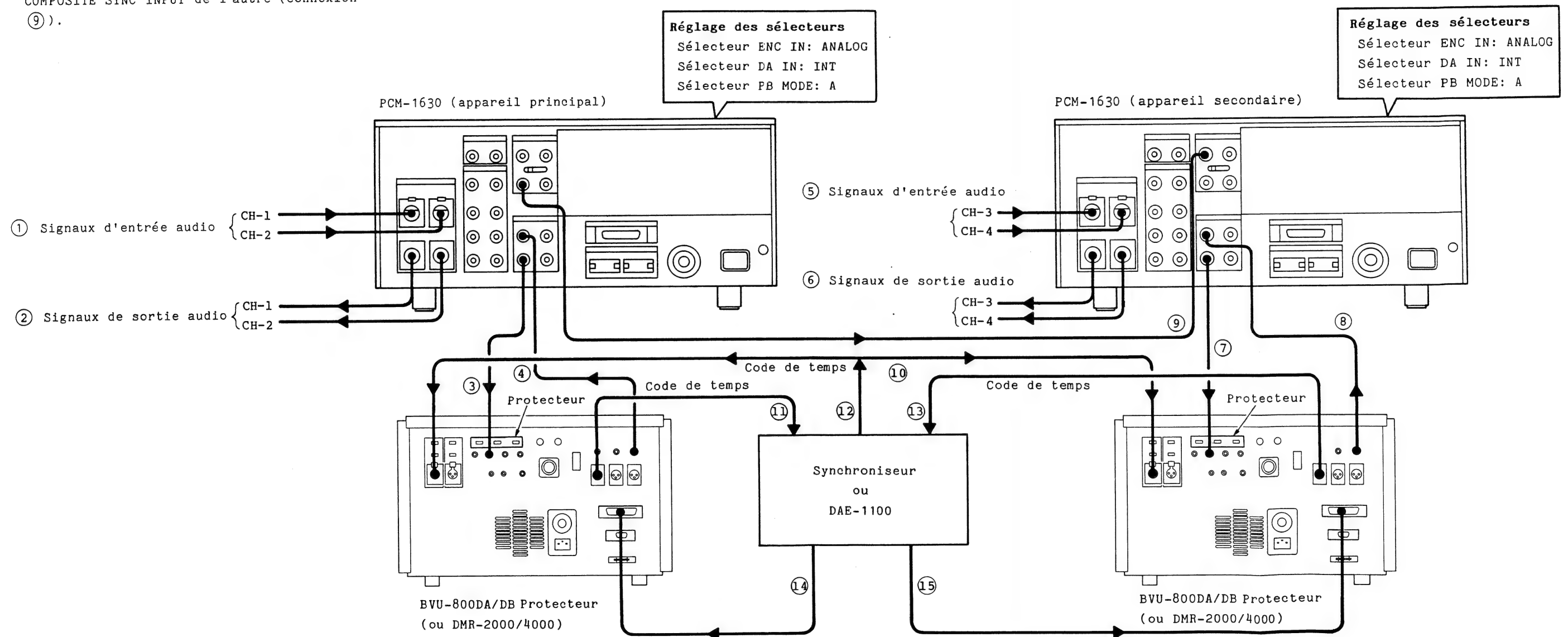
DAE-1100A (processeur)

Lecteur : DMR-4000 (ou DMR-2000, BVU-800DB)

1-7-5. Synchronisation entre deux PCM-1630

En faisant appel à deux appareils enregistreurs et à deux PCM-1630, un enregistrement et une lecture à quatre canaux sont possibles. Effectuer les connexions pour l'enregistrement et la lecture entre chaque enregistreur et la paire de PCM-1630 (connexions ① et ⑧). Pour synchroniser les deux PCM-1630 entre eux, raccorder le connecteur COMPOSITE SYNC OUTPUT d'un PCM-1630 au connecteur COMPOSITE SYNC INPUT de l'autre (connexion ⑨).

Pour une lecture synchronisée, enregistrer le code de temps sur la piste du canal-2 audio de la bande des deux enregistreurs. Si les deux enregistreurs doivent être synchronisés avec précision par unités de cadre pendant la lecture, il sera nécessaire d'ajouter au système un synchroniseur ou un éditeur DAE-1100 (connexions ⑩ à ⑮).



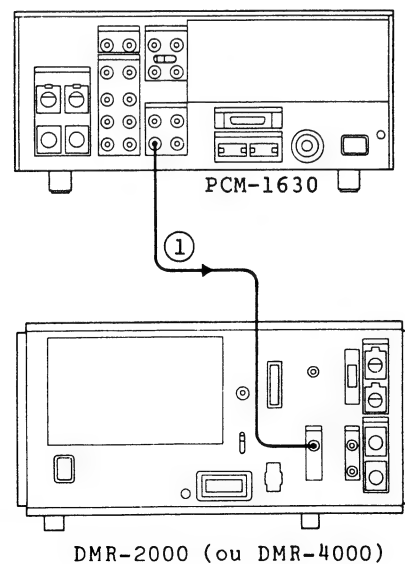
1-7-6. Enregistrement et lecture du code de temps SMPTE

Si un code de temps est enregistré sur une bande elle-même enregistrée en PCM, il est facile de localiser un seuil de montage et de procéder avec précision à des travaux de montage de bande.

Quand on utilise pour l'enregistrement un enregistreur DMR-2000/4000 où est incorporé un générateur de code de temps, ce code de temps s'enregistre automatiquement sur la piste du canal-2 audio de la bande par simple raccordement du connecteur COMPOSITE DIGITAL OUTPUT du PCM-1630 au connecteur COMPOSITE DIGITAL (VIDEO) IN de l'enregistreur (connexion ①).

La connexion ① fournit le signal de référence pour le verrouillage d'asservissement, ainsi qu'un signal d'enregistrement à l'enregistreur.

Quand un magnétoscope, différent du DMR-2000/4000, est utilisé pour l'enregistrement, il est nécessaire d'intercaler dans le système un générateur de code de temps, tel que le Sony BVG-1600 et un lecteur de code de temps, comme le Sony BVG-1500. Dans ce cas, un signal de synchronisation composite doit être fourni du PCM-1630 au générateur de code de temps afin de synchroniser le générateur de code de temps et le PCM-1630.



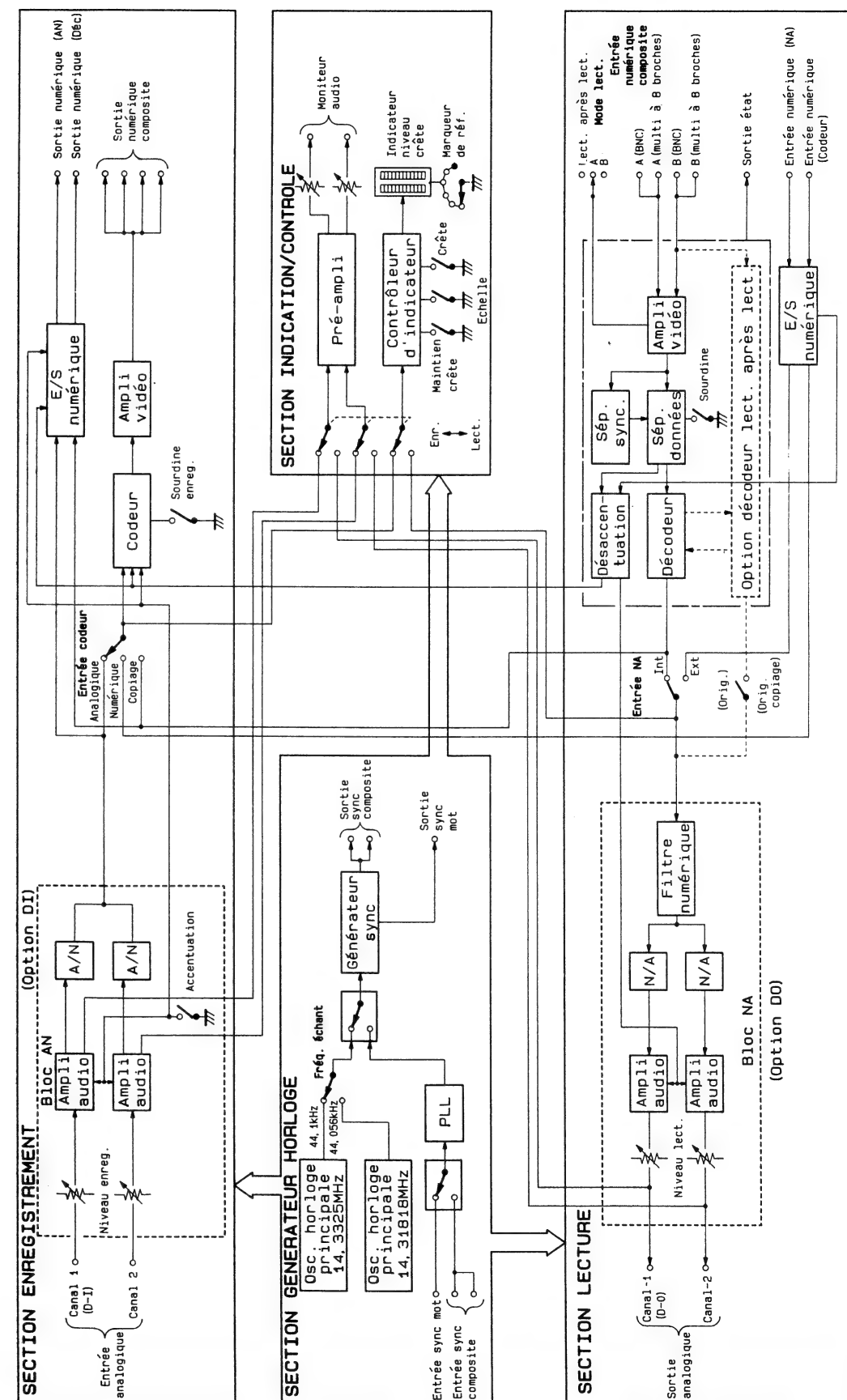
Enregistrement du code de temps sur une bande vierge

Quand un code de temps doit être enregistré sur une bande vierge pour l'enregistrement ou le montage, il est conseillé d'enregistrer simultanément un signal de sourdine sur la piste du signal PCM (piste vidéo). Pour enregistrer un signal de sourdine, régler le sélecteur ENC IN du PCM-1630 sur ANALOG et l'interrupteur REC MUTE de la plaquette ENC-2 du PCM-1630 sur ON. Un signal de sourdine, comportant les informations de la fréquence d'échantillonnage et celles d'accentuation, est sorti par le connecteur COMPOSITE DIGITAL OUTPUT du PCM-1630. Raccorder le PCM-1630 et l'enregistreur de la même façon que celle pour l'enregistrement/lecture du code de temps.

Remarque

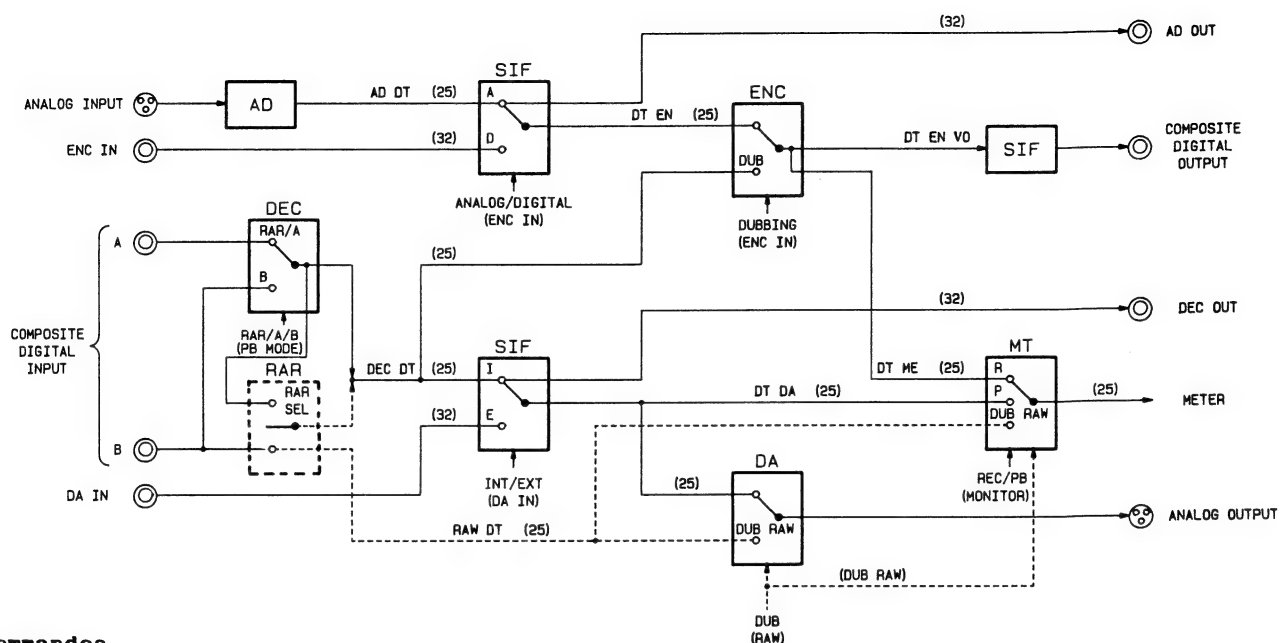
Après l'enregistrement du code de temps, prendre soin de ramener sur OFF l'interrupteur REC MUTE du PCM-1630 car s'il est laissé sur ON, l'enregistrement ne sera pas possible.

1-8. SCHEMA DE PRINCIPE



1-9. PARCOURS DU SIGNAL

1-9-1. Organigramme des données



Commandes

Sélecteur ENC IN: ANALOG/DIGITAL/DUBBING

(25), (32): Numéro des fentes

Sélecteur DA IN: INT/EXT

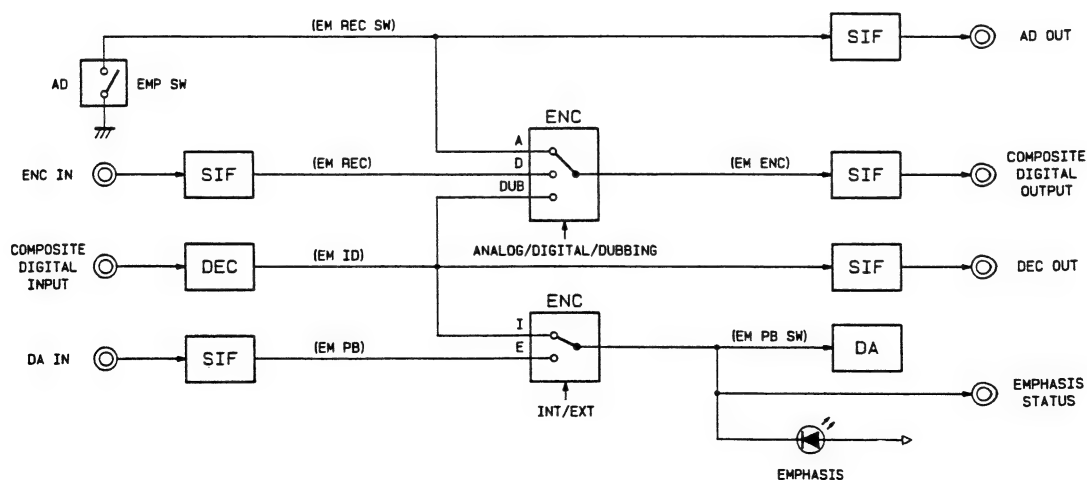
Sélecteur MONITOR: REC/PB

Interrupteur PB MODE : RAR/A/B

Interrupteur RAW (sur la plaquette

RAR-1 en option) : EDT/OFF/DUB

1-9-2. Organigramme des données d'accentuation



Commandes

Sélecteur ENC IN: ANALOG/DIGITAL/DUBBING

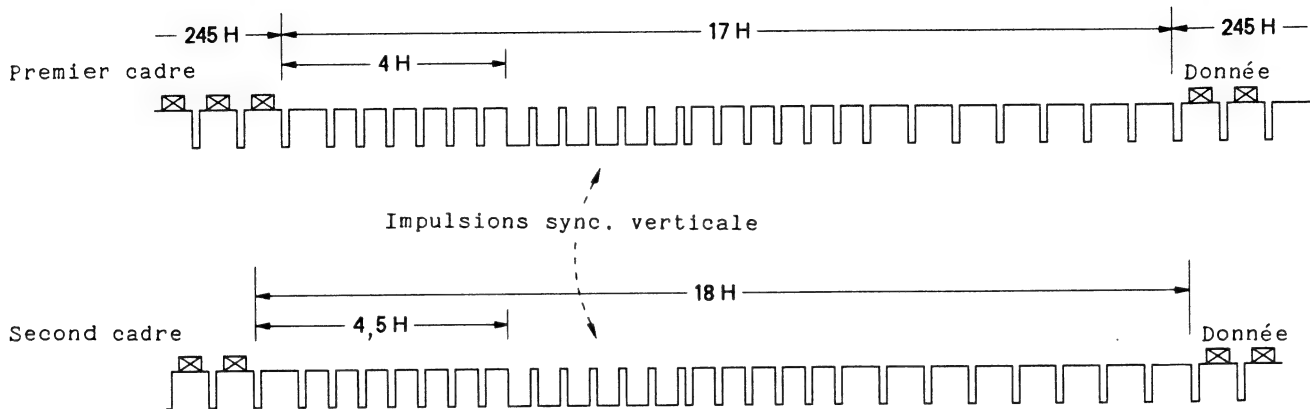
Sélecteur DA IN: INT/EXT

Interrupteur EMP (sur plaquette AD-23) : ON/OFF

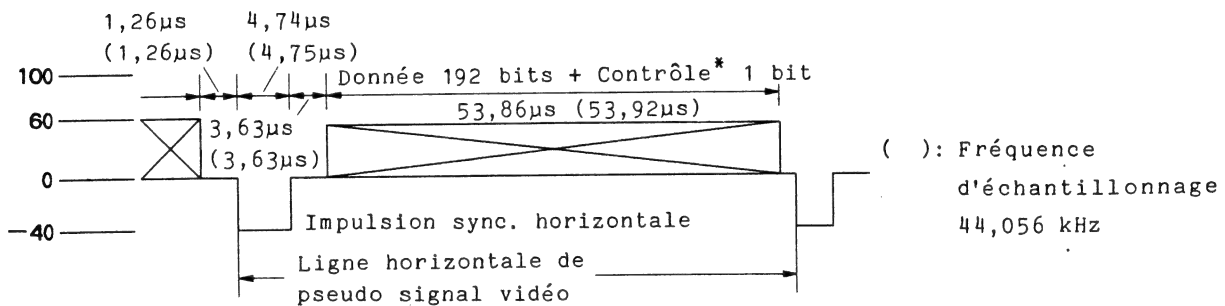
1-10. STRUCTURE DU SIGNAL

1-10-1. Signaux d'entrée/sortie (vidéo) numérique composite

Configuration des données



Formes d'onde (vidéo) numérique composite



* Bit de contrôle (le 129ème bit)

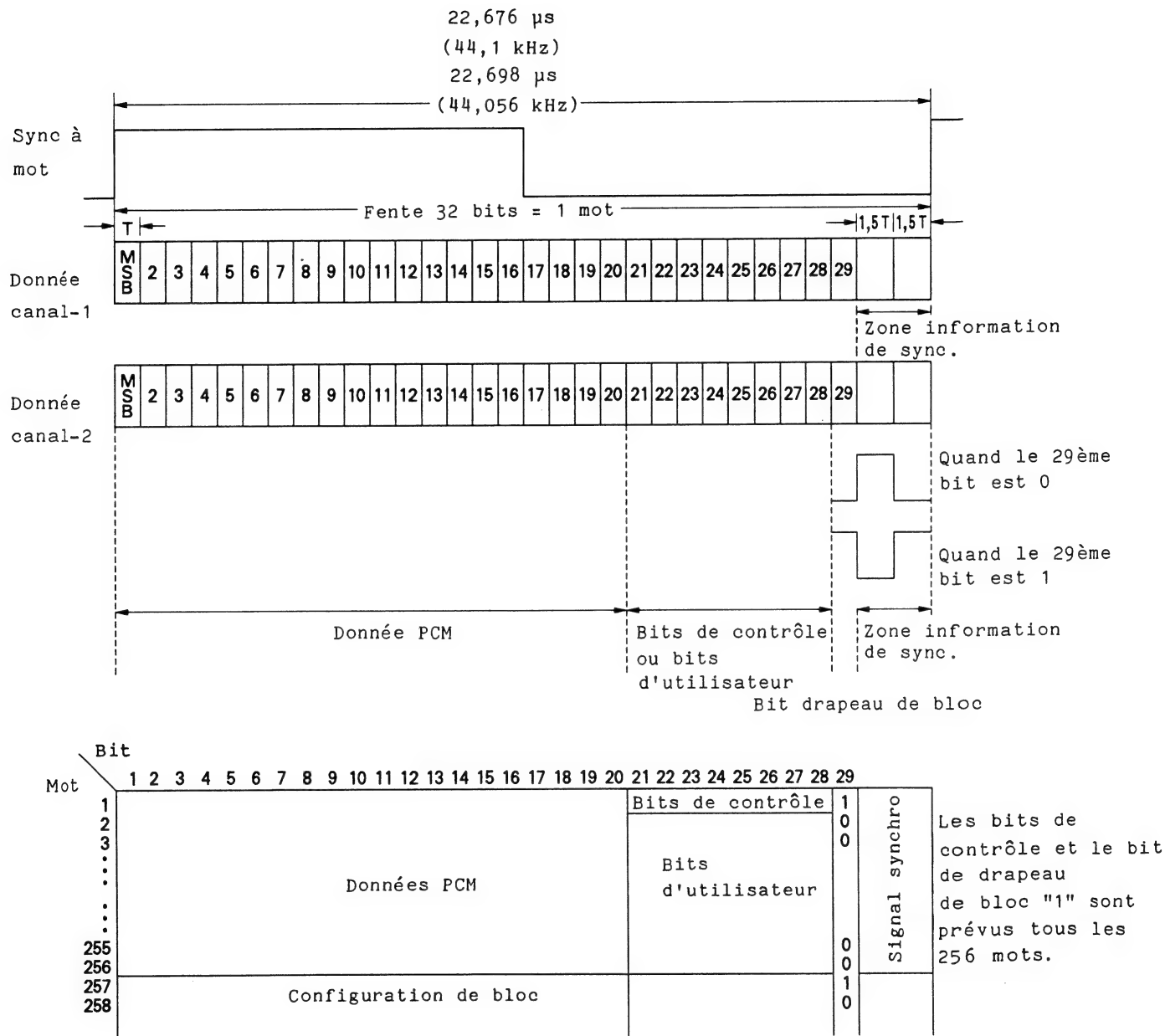
1 cadre = 7 blocs

1 bloc = 35 H

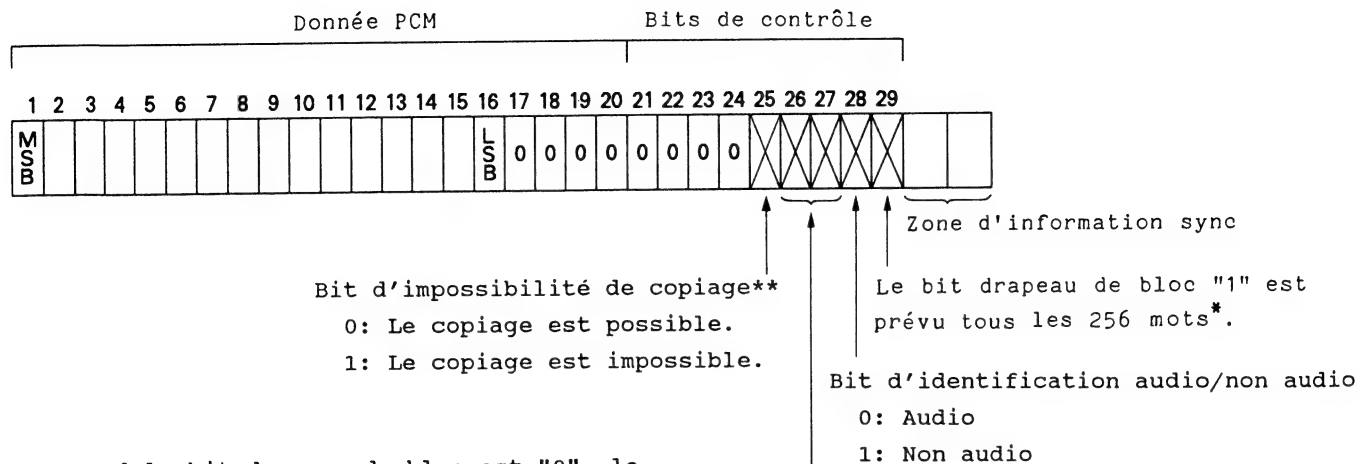
- Accentuation (le 1er H de chaque bloc)
ON: Donnée '0' (noir sur moniteur TV)
OFF: Donnée '1' (blanc sur moniteur TV)
- Fréquence d'échantillonnage (le 2ème H de chaque bloc)
44,1 kHz: Donnée '0' (noir sur moniteur TV)
44,056 kHz: Donnée '1' (blanc sur moniteur TV)
- Mode (le 3ème H de chaque bloc)
Format SI: Donnée '1' (blanc sur un moniteur de télévision)
Format EI: Donnée '0' (noir sur un moniteur de télévision)
- Audio/code (le 4ème H de chaque bloc)
Audio: Donnée '1' (blanc sur un moniteur de télévision)
Code: Donnée '0' (noir sur un moniteur de télévision)

1-10-2. Signaux d'entrée/sortie et de contrôle numérique

Format entrée/sortie numérique



Structure de bloc de signal de contrôle



* Quand le bit drapeau de bloc est "0", le bit d'identification audio/non audio, le bit d'impossibilité de copie et les bits d'identification d'accentuation sont également "0".

** Dans le PCM-1630, le bit d'impossibilité de copiage est toujours "0".

*** Pour interface (signal: DA IN CH-1) entre le DAE-1100A, portant le N° de série 10601 et au-delà, et le PCM-1630, portant le N° de série 11301 et au-delà, le 26e bit est utilisé indépendamment comme bit de signal EDIT. Par conséquent, seul le 27e bit est utilisé comme bit d'identification d'accentuation.

26e bit

0: Normal

1: Montage automatique

1-11. SYNCHRONISATION

Le dispositif d'asservissement du cabestan de l'appareil enregistreur pour l'enregistrement et la lecture des signaux audio numériques doit être verrouillé au signal de synchronisation du PCM-1630.

D'autre part, si le système d'enregistrement/lecture, comportant un PCM-1630 et un enregistreur, doit être synchronisé à un autre appareil (tel qu'un magnétoscope pour l'enregistrement/lecture des signaux vidéo ou un appareil audio), ce système et l'appareil utilisé devront être synchronisés à l'aide d'un signal de synchronisation externe. La méthode suivante est recommandée pour la synchronisation:

1) Quand un signal PCM est directement fourni du PCM-1630 à un enregistreur:

Un signal de synchronisation du connecteur COMPOSITE DIGITAL OUT ou du connecteur COMPOSITE SYNC OUTPUT du PCM-1630 est fourni à l'enregistreur. (Voir les Fig. 1 et 2, (A).)

2) Pour synchroniser entre eux des systèmes comportant un PCM-1630, ou pour synchroniser un système, comportant un PCM-1630, à un autre système:

Un signal de synchronisation peut être fourni à partir d'un générateur de synchronisation externe ou bien d'un PCM-1630. Un signal de synchronisation ou plusieurs sortes signaux de synchronisation, verrouillés entre eux, peuvent être utilisés dans le système. Il est conseillé que le signal de synchronisation du connecteur COMPOSITE SYNC OUTPUT ou du connecteur WORD SYNC OUTPUT d'un PCM-1630 soit fourni comme illustré. (Voir les Fig. 1 et 2, (B) et (C).)

Priorité du signal de synchronisation

1. signal de synchronisation composite
2. signal de synchronisation à mot
3. signal de synchronisation DI (à partir de la plaquette E/S numérique, en option)

Fig. 1 Synchronisation utilisant un signal de synchronisation composite externe

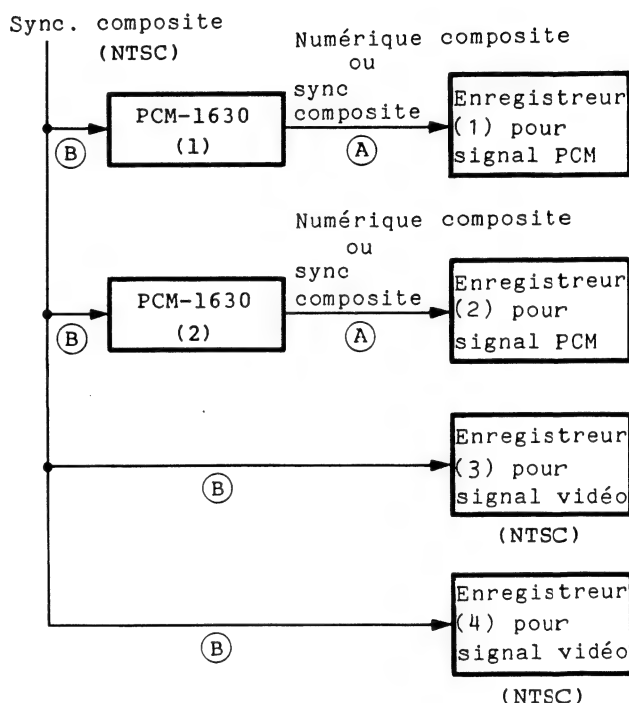
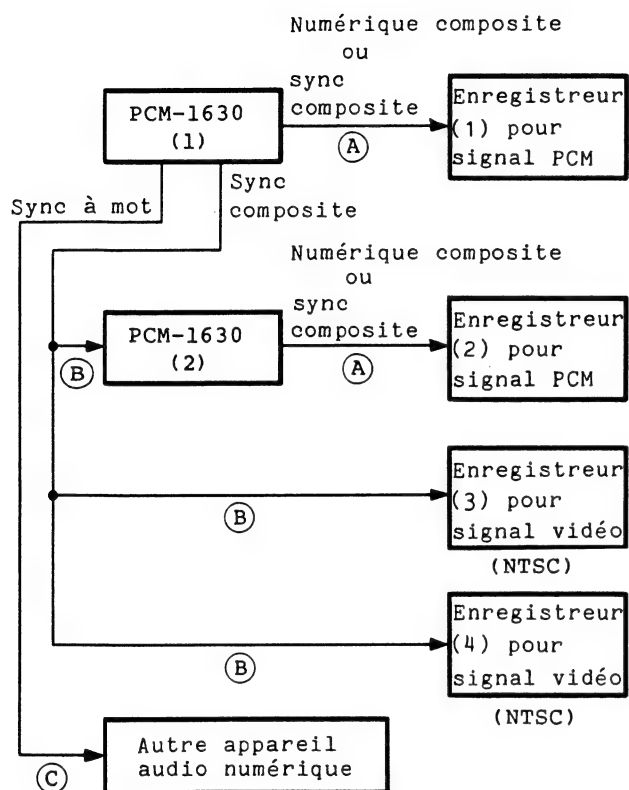


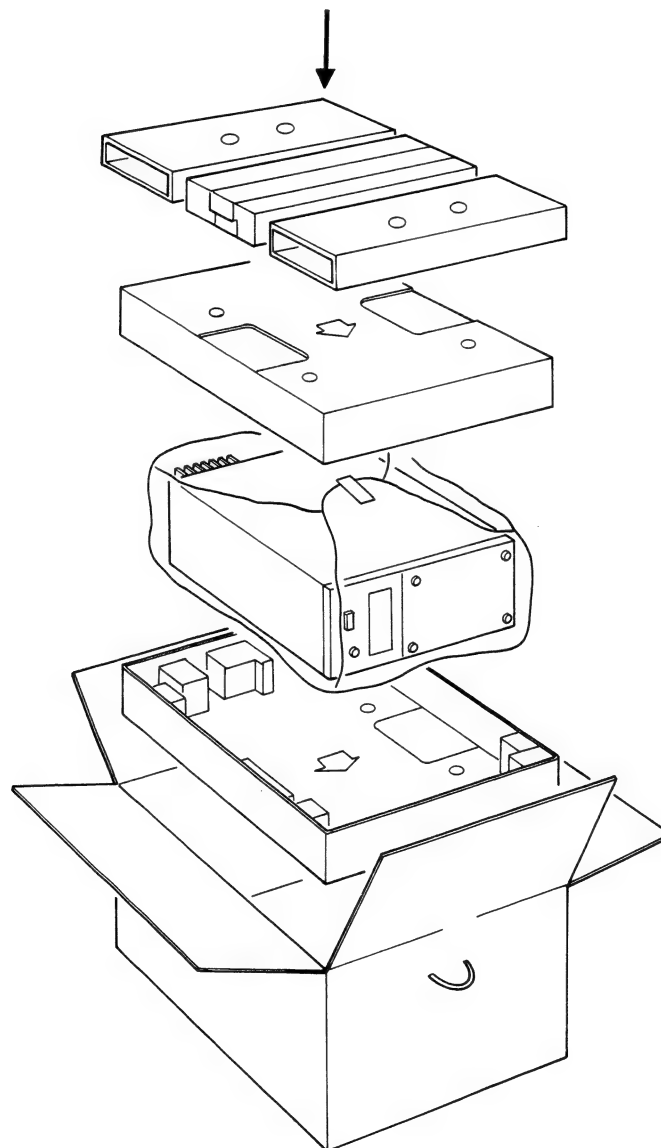
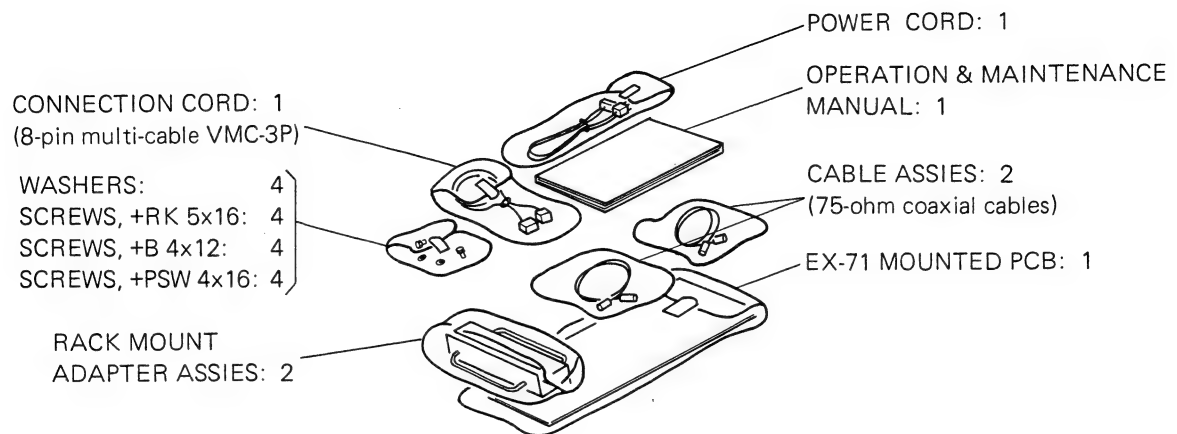
Fig. 2 Synchronisation utilisant le signal de sortie de sync composite et le signal de sortie sync à mot du PCM-1630 (1)



SECTION 2

SERVICE INFORMATION

2-1. REPACKING



2-2. RACK MOUNTING

Parts required

Slide Rails for Rack Mounting **1 set**
(Includes two inner members and two outer members.)
ACCURIDE Model 203, length 26" (660 mm)

Brackets (ACCURIDE #5355): **4**

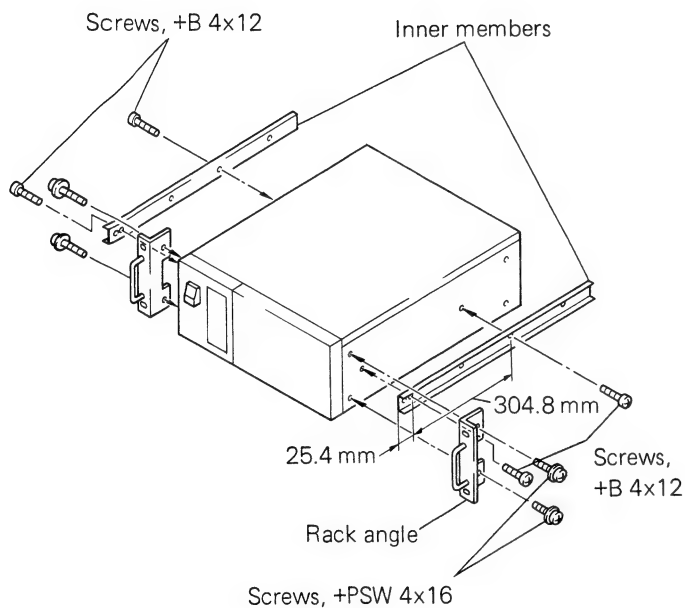
Bracket mounting screws and outer member mounting screws: **1 set**

Accessories Supplied

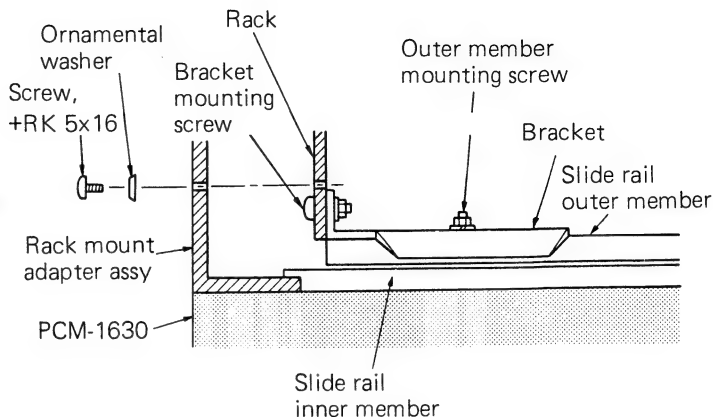
Rack mount Adapter Assy (A-7810-169-A): 2
Ornamental Washer (3-703-064-00): 4
Screw +RK 5x16 (7-682-378-04): 4
Screw +B 4x12 (7-682-563-04): 4
Screw +PSW 4x16 (7-682-965-01): 4

Rack Mounting Procedure

1)



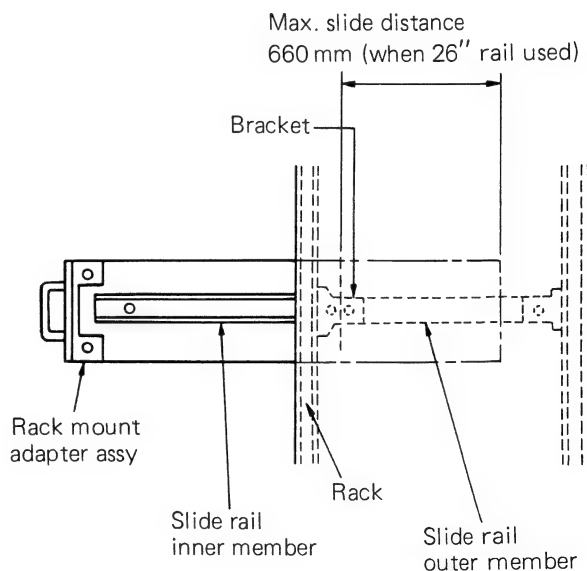
2) Fix the bracket to the outer member and mount the bracket to the rack as follows.



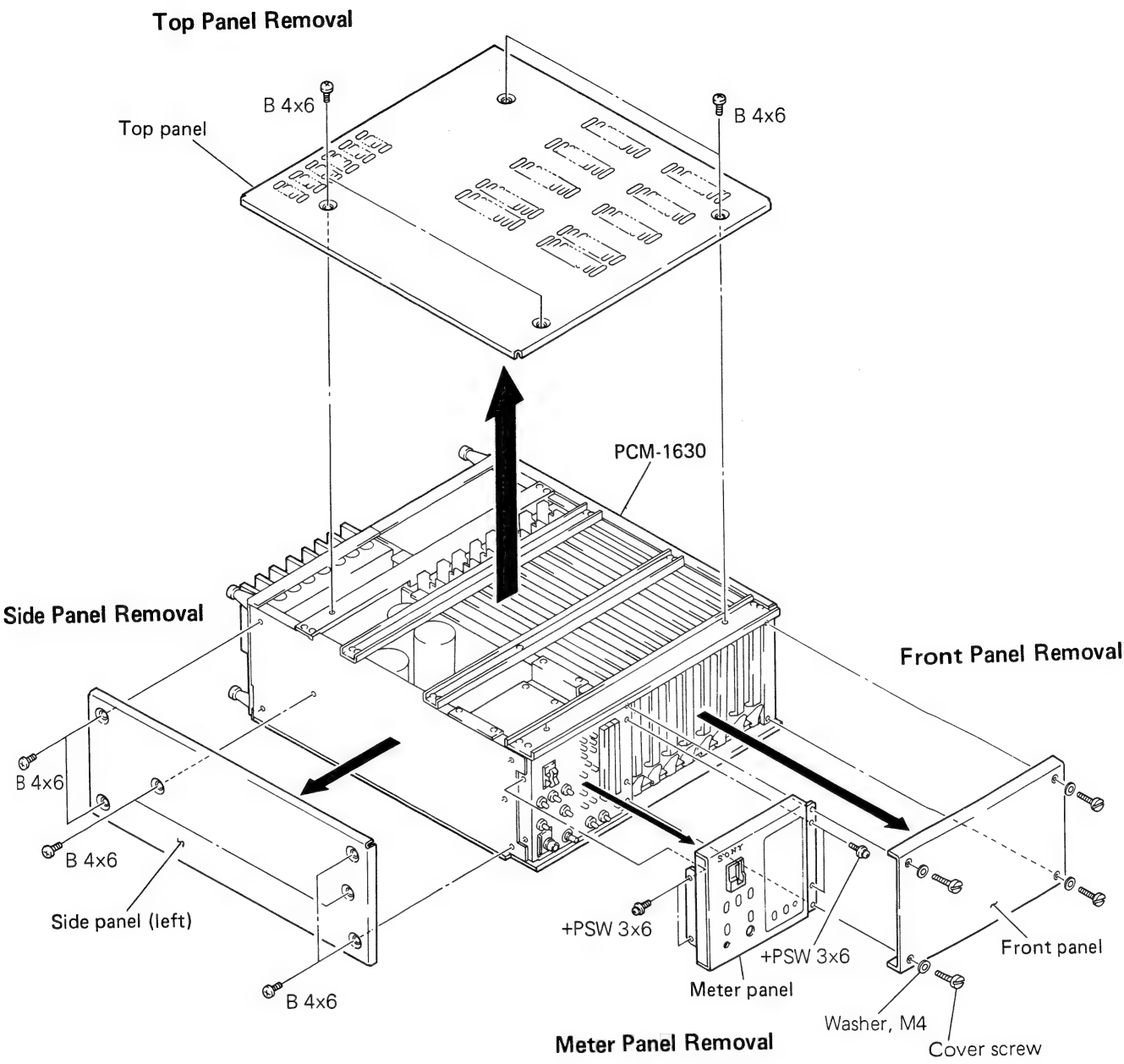
Note:

For the brackets, outer member mounting screws and bracket mounting screws, use the ones recommended by the slide rail manufacturer.

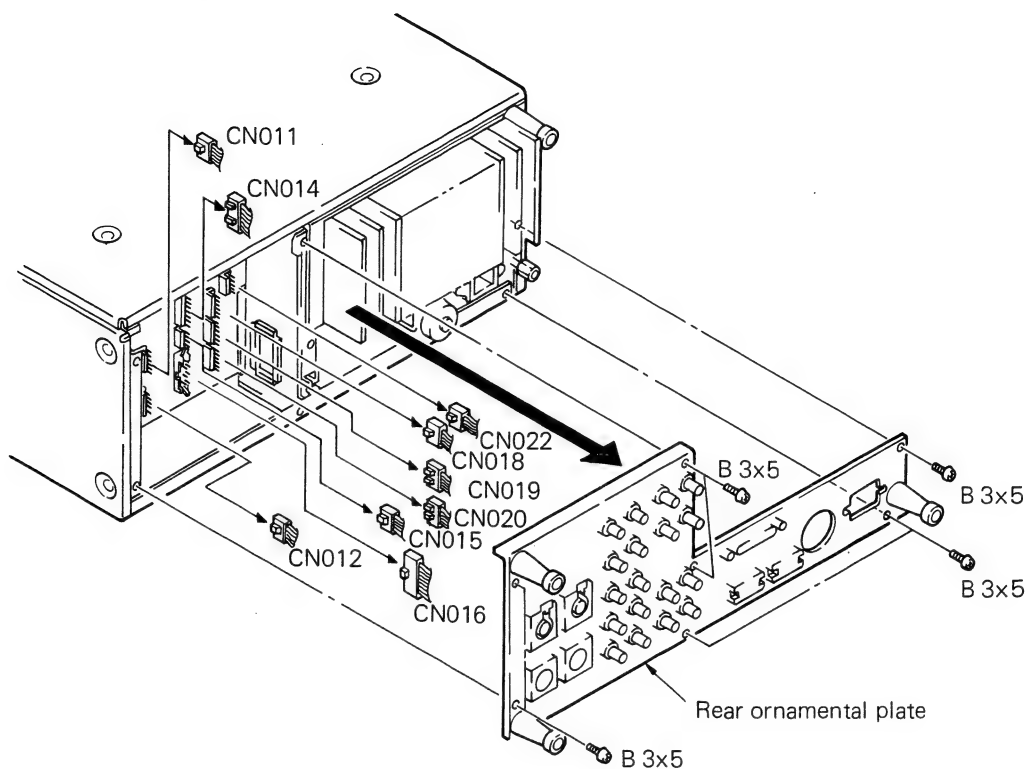
3) Push the PCM-1630 into the rack and secure it to the rack with +RK 5x16 screws and ornamental washers.



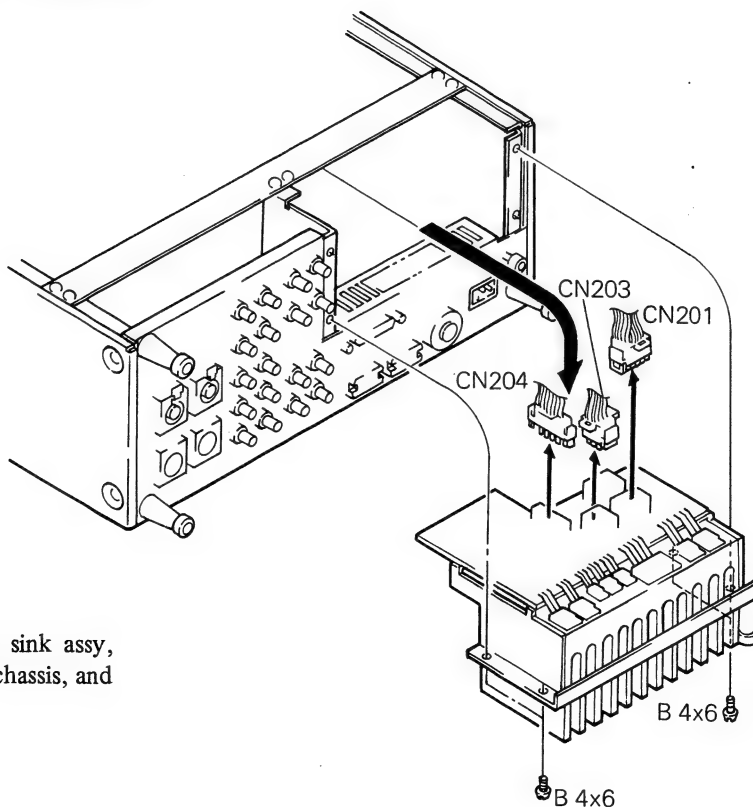
2-3. CASE REMOVAL



Rear Ornamental Plate Removal



2-4. HEAT SINK ASSY REMOVAL



Caution:

When reinstalling the heat sink assy, first put the harness in the chassis, and then install the heat sink.

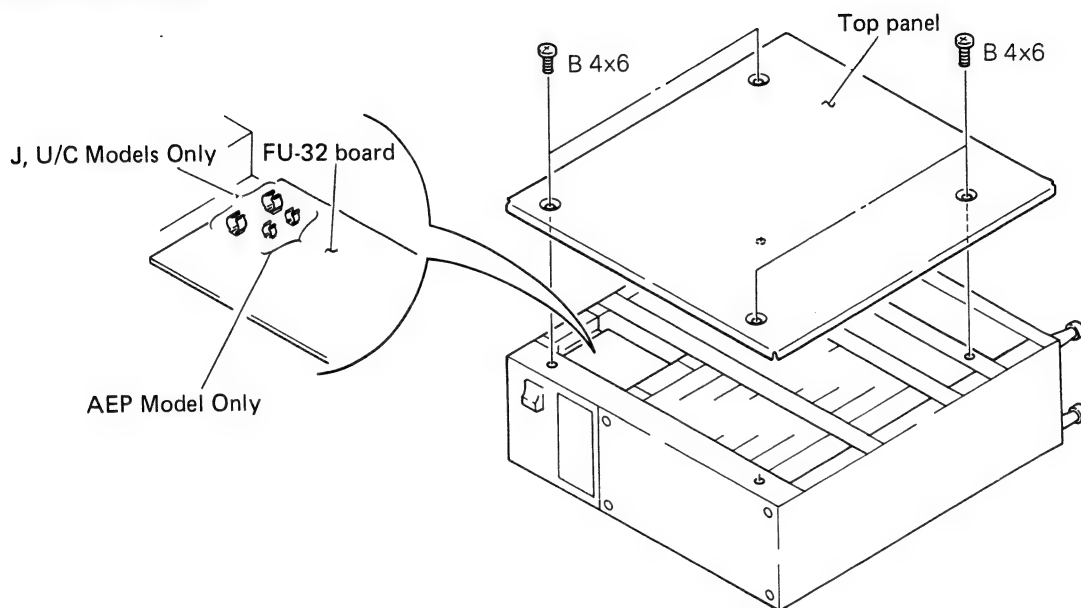
2-5. CAUTION FOR PS-81 BOARD AND FUSE REPLACEMENT

Fuse Replacement

- 1) Turn off the power switch.
- 2) Remove the top panel.
- 3) Replace the fuse on the FU-32 board.

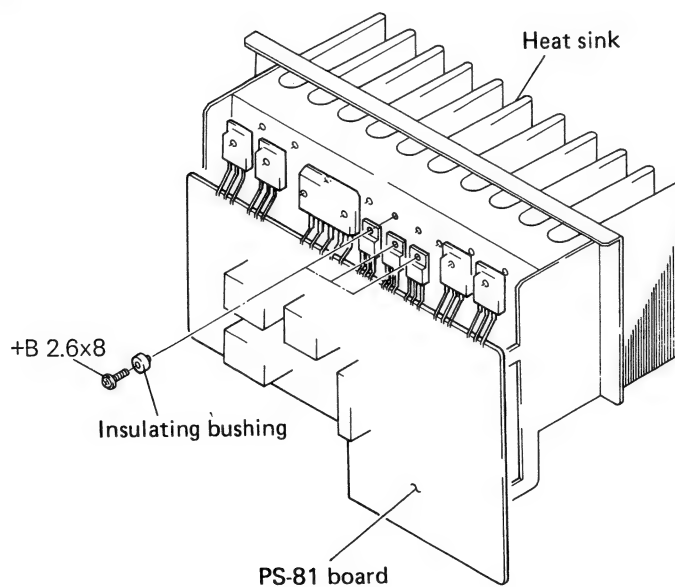
Caution:

The fuse for J and U/C Models differs from that for AEP Model in the location.



PS-81 Board Replacement

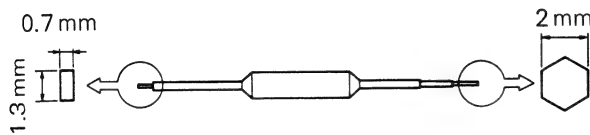
When installing the regulators of PS-81 board on the heat sink, do not forget to use an insulating bushing to prevent short circuit between the radiator fins of three regulators (Q4, Q5 and Q6) and the heat sink.



SECTION 3 ELECTRICAL ADJUSTMENTS

3-1. EQUIPMENTS REQUIRED

- (1) **DIGITAL DC VOLTMETER**
Effective digits; more than 4½ digits
Accuracy; less than 0.02% ±1 count
- (2) **STANDARD SIGNAL GENERATOR**
Hewlett-Packard Model 3325A
- (3) **NTSC TEST SIGNAL GENERATOR**
Tektronix 1410
Plug in Unit; SYNC GENERATOR SPG1/2
- (4) **AF OSCILLATOR**
Tektronix Model SG505
- (5) **DISTORTION METER**
Tektronix Model AA501
- (6) **FREQUENCY COUNTER**
Hewlett-Packard Model 5315A/OPT003
- (7) **OSCILLOSCOPE**
Tektronix Model 475A
- (8) **EX-71 EXTENSION BOARD**
Sony Part No. A-7850-303-A
One EX-71 board is supplied with PCM-1630.
- (9) **ADJUSTMENT SCREWDRIVER**
Sony Part No. 7-700-733-01



3-2. +5V·±22V VOLTAGE ADJUSTMENT (PS-81 BOARD)

Equipment: Digital DC Voltmeter
EX-71 Extension Board

Connection: Apply the line voltage set by the voltage selector to the unit.

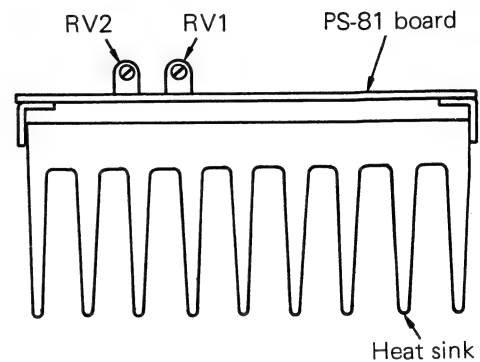
Adjustment

1. Insert the EX-71 extension board into the AD-23 board slot in the card rack.
2. Put the AD-23 board on the extension board.
3. Measure the following check points.

Voltage	Check Points (AD-23)		Adjustment (PS-81)	Specifications
	+	GND		
+5 V	A47·48 B47·48	A49·50 B49·50	RV1	+5 V ± 0.05 V
+22 V	A3·B3	A1·2 B1·2	RV2	+22 V ± 0.2 V
-22 V	A4·B4	A1·2 B1·2	—	-22 V ± 0.3 V

Note: -22 V must be checked only because it is linked with +22 V.

Adjustment Location



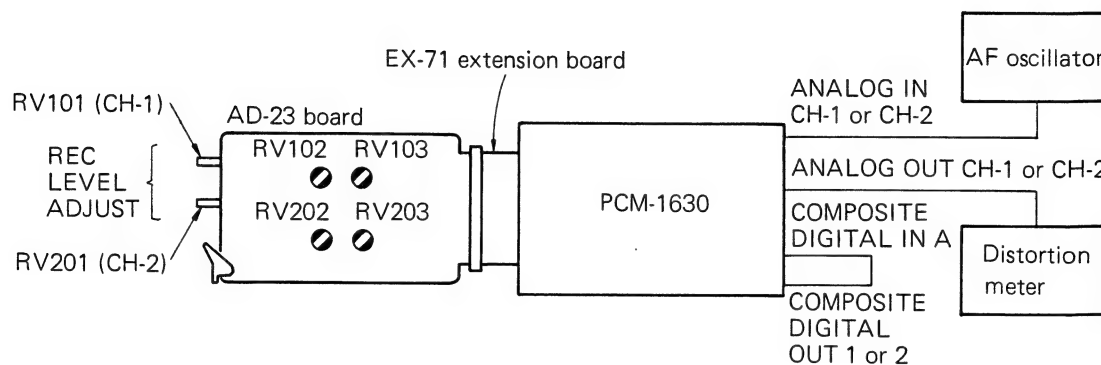
4. Insert the EX-71 extension board into each AD-23, DEC-15 and MT-16 board slot.
5. Put each AD-23, DEC-15 and MT-16 board on the extension board and check the following voltages.

Voltage	Check Points			Specifications
	Board Name	+	GND	
-8 V	AD-23	A6·B6	A5·B5	-8 V ± 0.3 V
+12 V	DEC-15	A3·B3	A1·2 B1·2	+12 V ± 0.5 V
-12 V	DEC-15	A4·B4	A1·2 B1·2	-12 V ± 0.5 V
+5 V	MT-16	A46·B46	A49·50 B49·50	+5 V ± 0.2 V

3-3. AD CONVERSION LEVEL ADJUSTMENT (AD-23 BOARD)

Equipment: Distorsion Meter
AF Oscillator
Oscilloscope
EX-71 Extension Board
75Ω BNC Cable

Connection:



Condition:

REFERENCE level 4 dBs (0 dBs = 0.775 Vrms),
Head room 20 dB

Switch Settings:

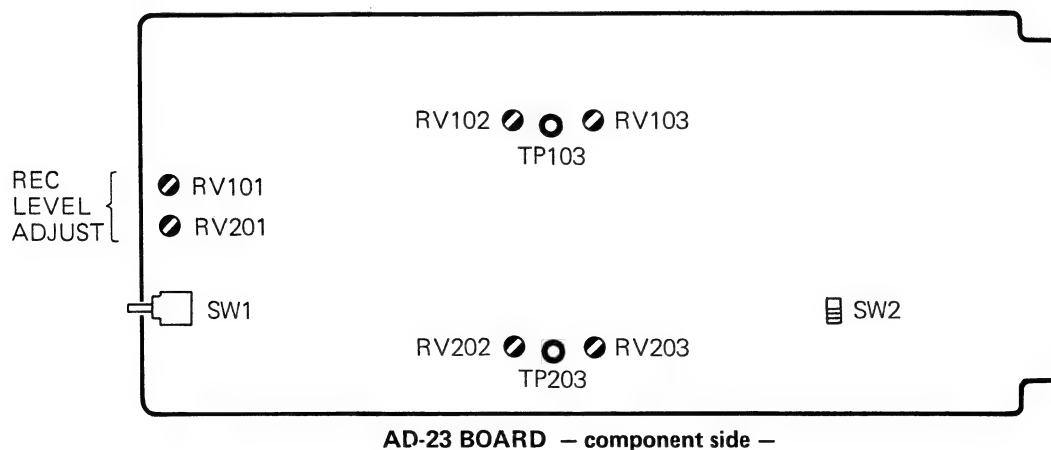
Front Panel SW

ENC IN SW: ANALOG
DA IN SW: INT
PB MODE: A
REF MARKER: -20 dB

AD-23 Board SW

EMP SW (SW1): OFF
DITHER SW (SW2): OFF

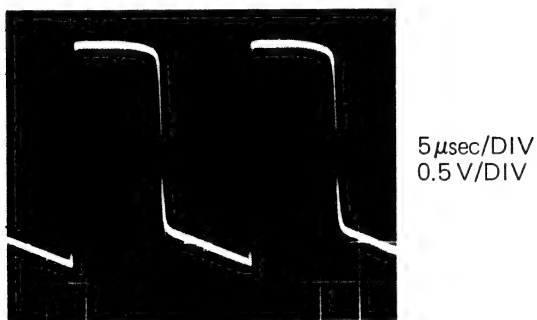
Adjustment Location



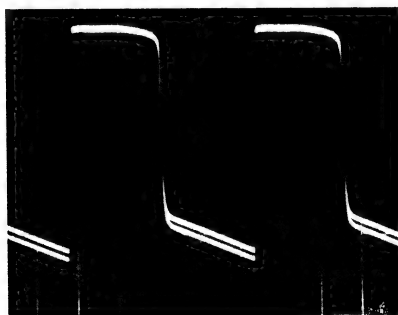
AD-23 BOARD — component side —

Adjustment

1. Input 1 kHz, 4 dBs signal to the ANALOG INPUT CH-1 (CH-2) connector.
2. Set the scale of the level meter to NORMAL and adjust RV101 (RV201) so that the signal level as indicated on the level meter coincides with REF MARKER.
3. Set the scale of the level meter to FINE.
4. Adjust RV103 (RV203) to obtain the minimum distortion (less than 0.04%).
5. Adjust RV102 (RV202) to obtain the minimum offset (the lowest point when the scale of the level meter set to FINE).
6. Disconnect the input signal.
7. Using the oscilloscope connected to TP103 (TP203), observe the waveform as shown below.
9. Turn RV103 (RV203) clockwise slowly.
The above double base disappears and single base appears. Turning it furthermore, the double base appears again. This is called as 2nd double base. Turning furthermore, 3rd double base appears.
10. Set RV103 (RV203) to the middle point between 2nd and 3rd double bases.
11. Input 1 kHz, 4 dBs signal to the ANALOG INPUT CH-1 (CH-2) connector, and adjust RV102 (RV202) to obtain the minimum offset.
12. Adjust RV101 (RV201) so that the signal level as indicated on the level meter coincides with REF MARKER.
13. Check the distortion.
Spec.; Less than 0.04%



8. Turn RV103 (RV203) fully counterclockwise.
The base of the waveform at TP103 (TP203) becomes doubly as shown below. This is called as 1st double base.

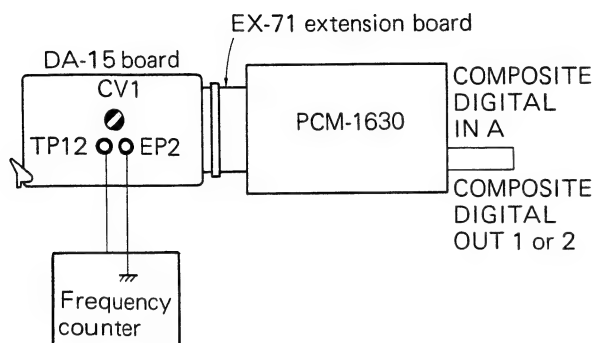


3-4. DA CONVERSION AND ANALOG OUTPUT ADJUSTMENTS (DA-15 BOARD)

3-4-1. Oscillator Frequency Adjustment

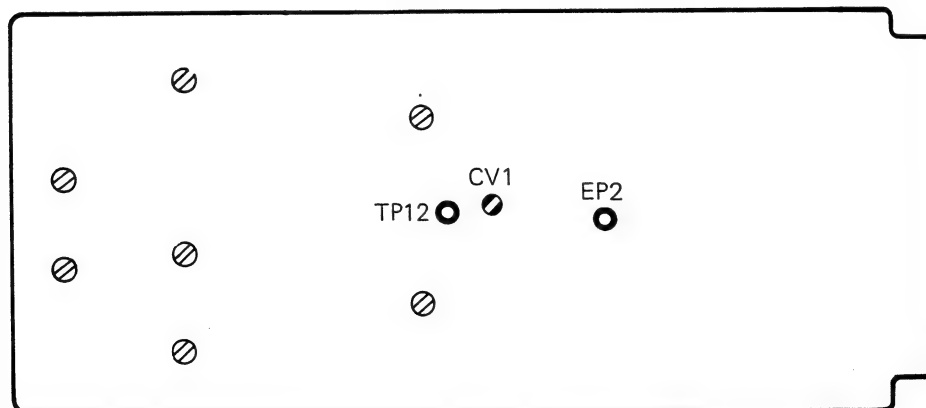
Equipment: Frequency Counter
EX-71 Extension Board
75Ω BNC Cable

Connection:



Adjustment

1. Connect the frequency counter to TP12 on the DA-15 board.
2. Adjust CV1 to obtain the following specification.
Spec.; 39933.10 ± 0.02 kHz
3. If the beat grates on the ear when the signal is not inputted, finely adjust CV1.

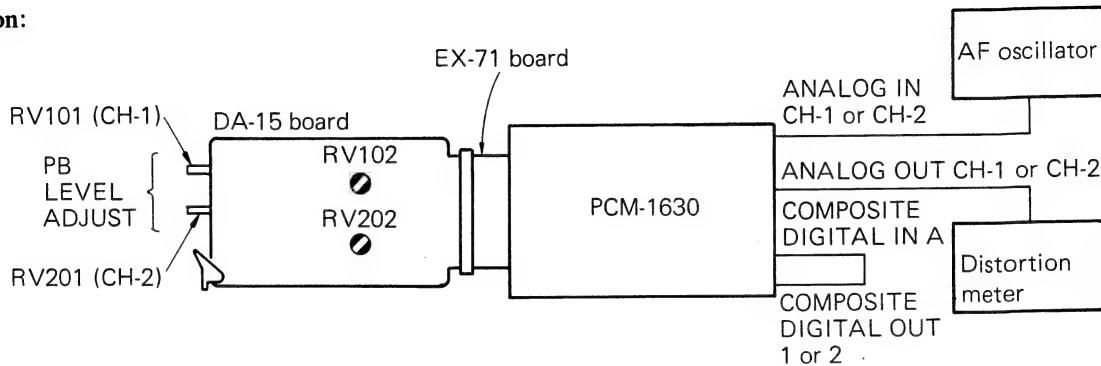


DA-15 BOARD — component side —

3-4-2. Level Adjustment

Equipment: Distortion Meter
AF Oscillator
EX-71 Extension Board
75Ω BNC Cable

Connection:



Condition:

REFERENCE level 4 dBs (0 dBs = 0.775 Vrms)
Head room 20 dB

Switch Settings:

Front panel SW

ENC IN SW: ANALOG
DA IN SW: INT
PB MODE: A
REF MARKER: -20 dB

AD-23 Board SW

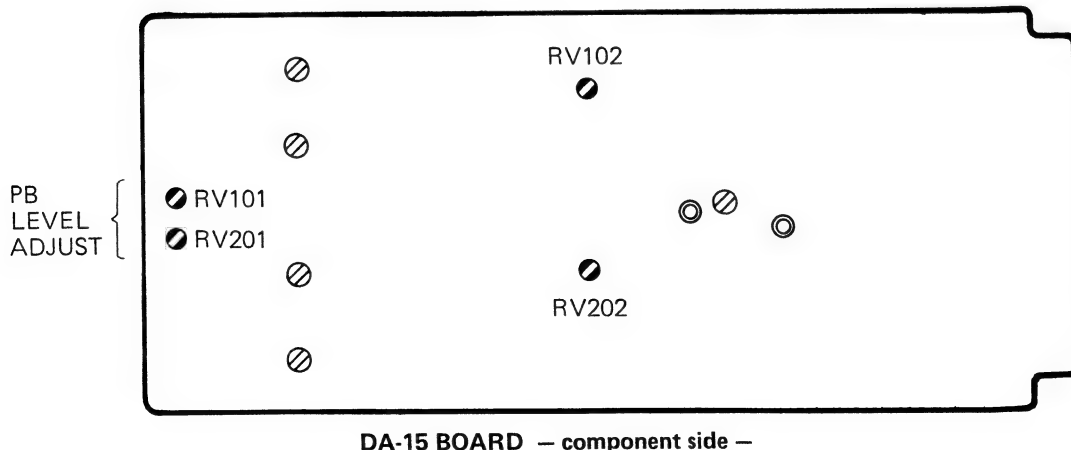
EMP SW (SW1): OFF
DITHER SW (SW2): OFF

Adjustment (1)

1. Input 1 kHz, 4 dBs signal to the ANALOG INPUT CH-1 (CH-2) connector.
2. Set the scale of the level meter to NORMAL and confirm that the signal level as indicated on the level meter coincides with REF MARKER.
If necessary, perform "3-3. AD Conversion Level Adjustment" again.
3. Adjust RV101 (RV201) to obtain the following specification.
Spec.; Output Level 4 dBs \pm 0.1 dBs

Adjustment (2)

1. Input 16 kHz, 14 dBs signal to the ANALOG INPUT CH-1 (CH-2) connector.
2. Adjust RV102 (RV202) to obtain the following specification.
Spec.; Distortion Less than 0.03%

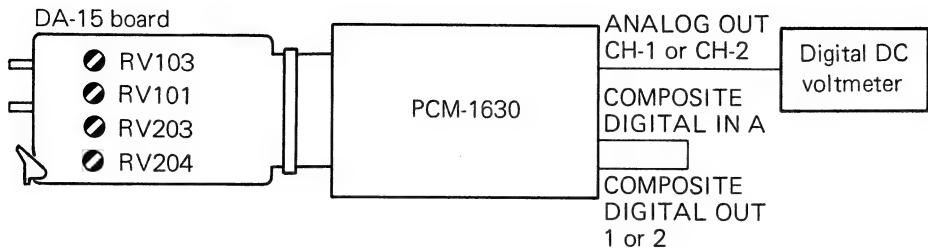


3. ELECTRICAL ADJUSTMENTS

3-4-3. Output Offset Adjustment

Equipment: Digital DC Voltmeter
EX-71 Extension Board

Connection:



Switch Settings:

Front Panel SW

ENC IN SW: ANALOG
DA IN SW: INT
PB MODE: A

AD-23 Board SW

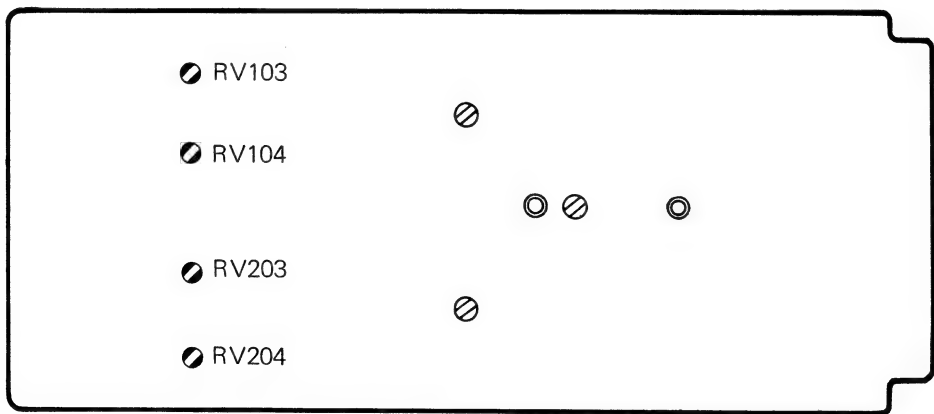
EMP SW (SW1): OFF
DITHER SW (SW2): OFF

Adjustment (2)

1. Remove the short circuit between COLD and GND described on step 2 of Adjustment (1) and measure the DC voltage between HOT and GND.
Spec.; $\pm 20\text{ mV}$
Adjust; RV103 (RV203)

Adjustment (1)

1. Turn on the power and perform aging for five minutes.
2. Short-circuit between COLD and GND of the ANALOG OUTPUT CH-1 (CH-2) connector.
3. Check the DC voltage between the above HOT and GND.
4. Adjust RV104 (RV204) to obtain the following specification.
Spec.; $\pm 20\text{ mV}$

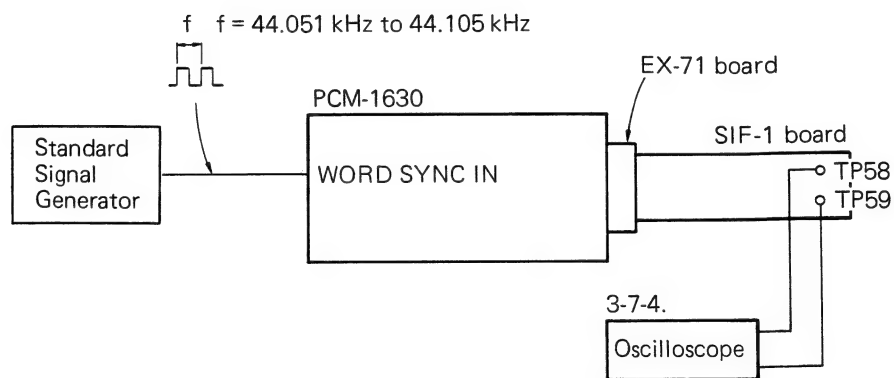
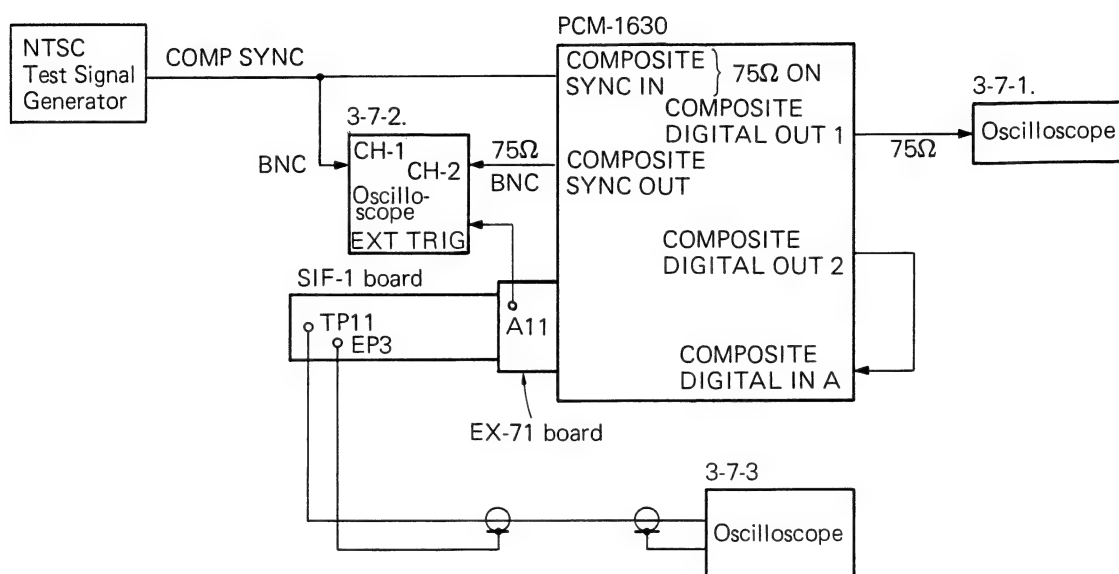


DA-15 BOARD — component side —

3-5. COMPOSITE DIGITAL OUTPUT AND CLOCK ADJUSTMENTS (SIF-1 BOARD)

Equipment: NTSC Test Signal Generator
Standard Signal Generator
Oscilloscope
EX-71 Extension Board

Connection:



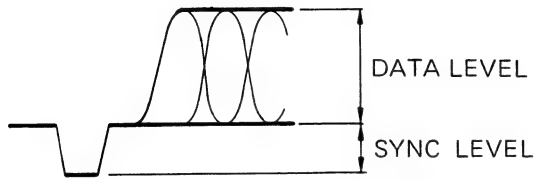
Switch Settings: Free

3-5-1. Composite Digital Output Level Adjustment

Adjust RV4 to obtain the following specification, and then adjust RV3.

SYNC LEVEL: 0.29 Vp-p
RV4

DATA LEVEL: 0.43 Vp-p
RV3



COMPOSITE DIGITAL OUTPUT WAVEFORM

3-5-2. Composite Sync Phase Adjustment

Adjust RV2 so that the phase of COMPOSITE SYNC IN (Board Connector No. A-10) coincides with that of the COMPOSITE SYNC OUT (Board Connector No. A-8).

3-5-3. Master Clock Duty Adjustment

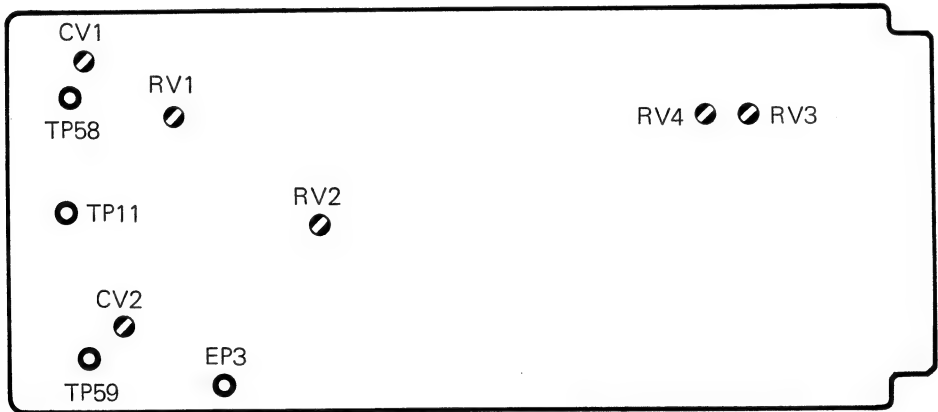
Adjust RV1 so that the Duty Factor of the waveform at TP11 comes to 50% as far as possible.

3-5-4. External Synchronization Adjustment

Sweep the 44.051 kHz to 44.105 kHz square wave (DUTY 50% TTL level) with standard signal generator and adjust CV1 and CV2 to obtain the following specification.

Spec.; Voltage at TP58
Within the range of 0.6V to 5.7V
CV1

Voltage at TP59
Within the range of 0.6V to 5.7V
CV2

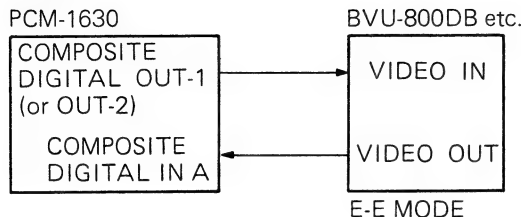


SIF-1 BOARD — component side —

3-6. SYNC AND DATA EXTRACTION LEVEL ADJUSTMENT (DEC-15 BOARD)

Equipment: Oscilloscope

Connection:



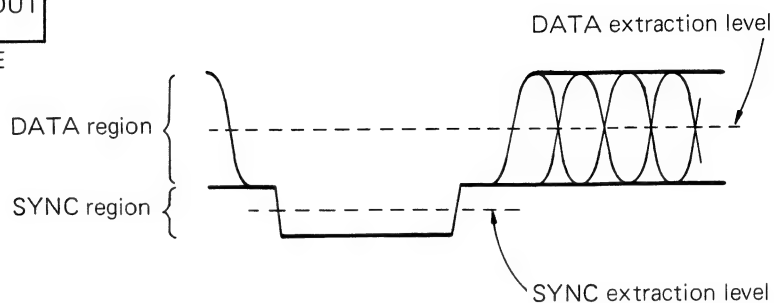
Switch Settings:

Front Panel SW

PB MODE: A

DEC-1 Board SW

SW3: ① ON ② ON ③ OFF ④ OFF

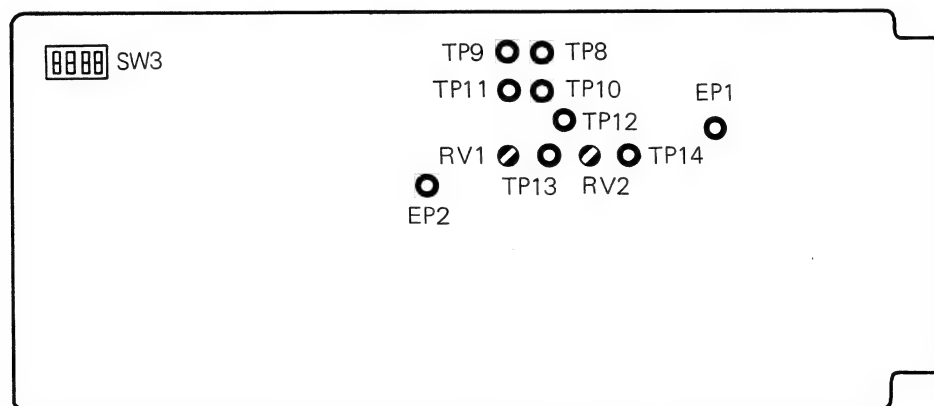


Waveform on the oscilloscope

Adjustment and Confirmation

1. Set both CH-1 and CH-2 of the oscilloscope to 0.5 V/DIV and 20 μ s/DIV ranges, and adjust so that the GND levels are at the center of the graticule lines.
2. Connect CH-1 to TP12 (VIDEO signal), CH-2 to TP13 (SYNC extraction level) and trigger with CH-1.
3. Turn RV1 and set the SYNC extraction level to the center (approx. +0.45V) of the SYNC region.
4. Connect CH-2 to TP14 (DATA extraction level).
5. Turn RV2 and set the DATA extraction level to the center (approx. +1.2 V) of the DATA region.
6. Connect CH-1 to TP8 (VIDEO signal), and CH-2 to TP9 (SYNC extraction level).
7. Check that the SYNC extraction level is at the approximate center of the SYNC region.
8. Connect CH-1 to TP10 (VIDEO signal) and CH-2 to TP11 (DATA extraction level).
9. Check that the DATA extraction level is at the approximate center of the DATA region.

For all of the above, connect the GND of CH-1 to EP1, and the GND of CH-2 to EP2.

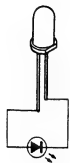


DEC-15 BOARD – component side –

SECTION A

SEMICONDUCTOR PIN ASSIGNMENTS

ICs, transistors and diodes whoses functions are equivalent are described here. Therefore, incompatible device names may be described together. For parts replacement, refer to the Replaceable Parts section in this manual.



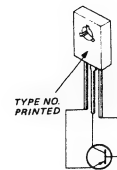
BG5534S
PR5534S
PY5534S



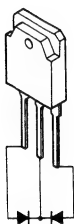
PR3432S
PG3432S
PY3432S



DTC143TF (R = 4.7 k)



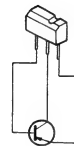
2SA1220A
2SB649A



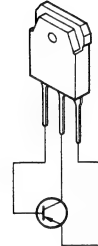
CTB-34
CTG-32S



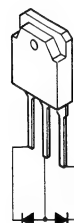
PG5531KX
PY5531K
PR5531K



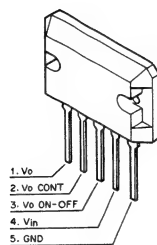
2SA874
2SA937
2SB822



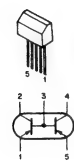
2SB757



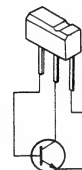
CTG-32R



STR9005



2SA995



2SC1652
2SC2021



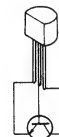
FC52M
FC53M
FC54M



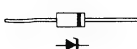
1SS97



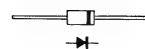
2SA1048L



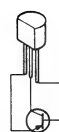
2SC2901



HZ ? ?LL
RD ? ?E
RD ? ?EB
RD ? ?EB2



10E-2
1SS119
30DF2

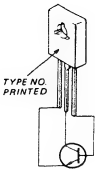


2SA1190

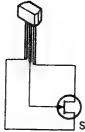


2SC2408

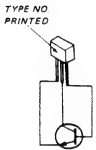
TRANSISTOR



2SC2690A
2SD669A



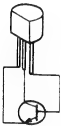
2SK118



2SC2785



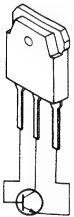
2SK152
2SK523



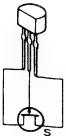
2SC2855



2SK170

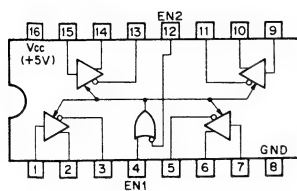


2SD847



2SJ74

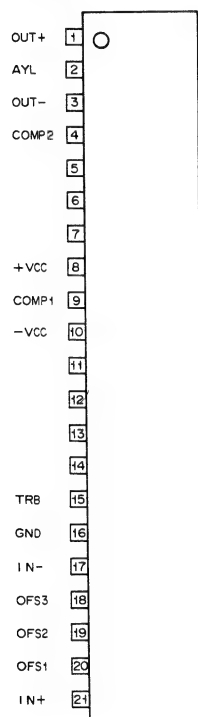
AM26LS31PC (ADVANCED MICRO DEVICE)
HIGH SPEED DIFFERENTIAL LINE DRIVER
— TOP VIEW —



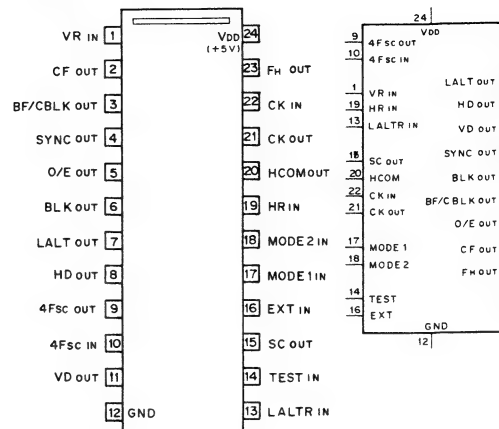
EN2	EN1	OUTPUT
0	0	ENABLE
0	1	ENABLE
1	0	HI-Z
1	1	ENABLE

0; LOW LEVEL
1; HIGH LEVEL
HI-Z; HIGH IMPEDANCE

BX1367 (SONY)
BX1391 (SONY)
AUDIO LINE AMPLIFIER
—SIDE VIEW—



CX-773B (SONY)
C-MOS SYNC GENERATOR (NTSC)
— TOP VIEW —



O/E : ODD/EVEN FIELD
CF : COLOR FRAME PULSE
HCOM : H COMPARATOR

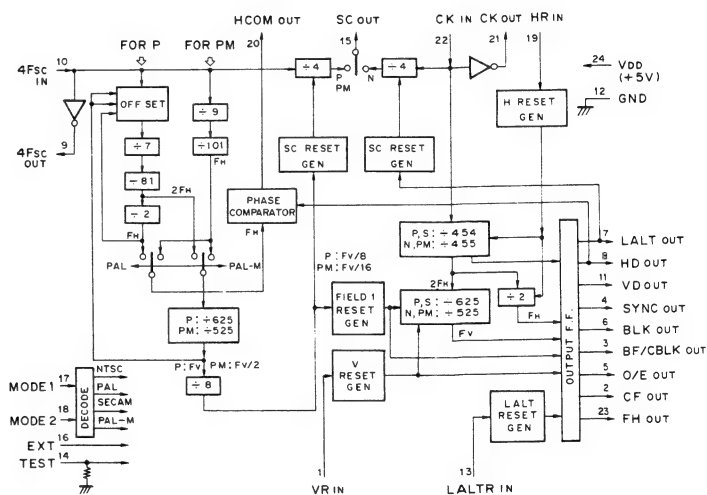
SYSTEM	4Fsc	CLOCK
NTSC	910 Fh	910 Fh
PAL	1135 Fh + 2 Fv	908 Fh
PALM	909 Fh	910 Fh
SECAM		908 Fh

MODE1	MODE2	SYSTEM
0	0	NTSC
0	1	SECAM
1	0	PALM
1	1	PAL

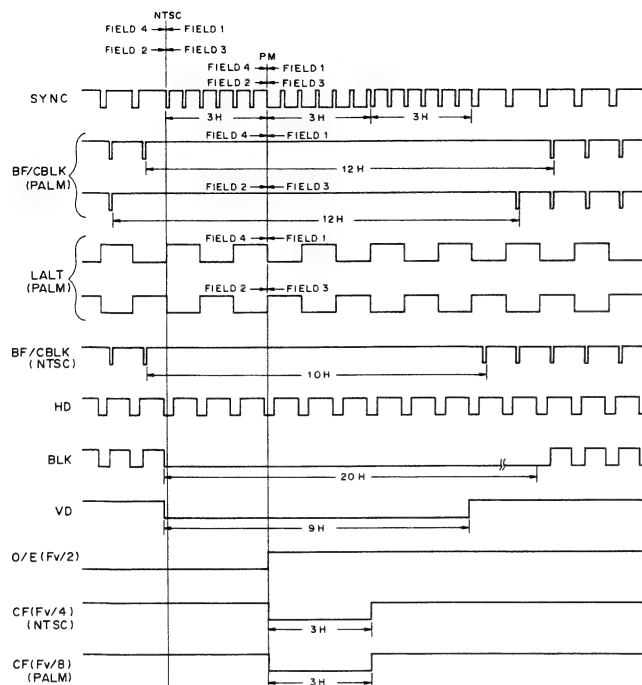
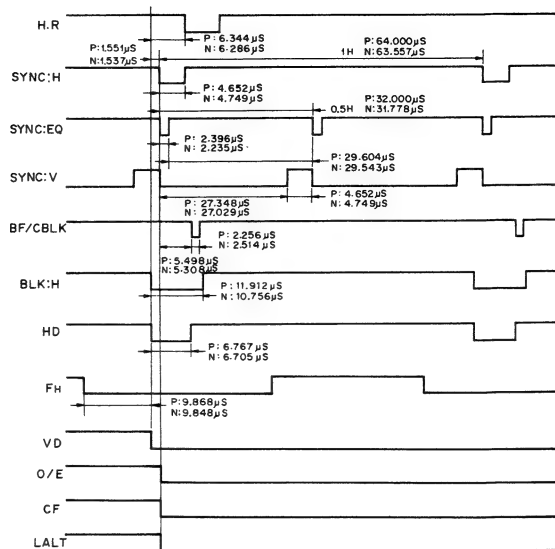
EXT	TEST	FUNCTION
0	0	INTERNAL
0	1	INVALID
1	0	EXT
1	1	TEST

0; LOW LEVEL (GND)
1; HIGH LEVEL (VDD)

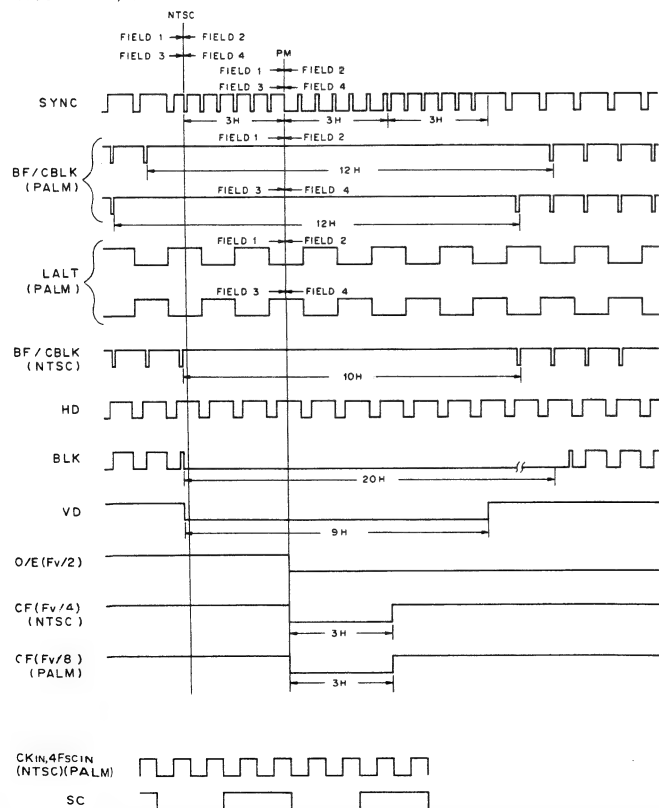
TEST 0: OPEN
(INTERNALLY
PULLED DOWN)



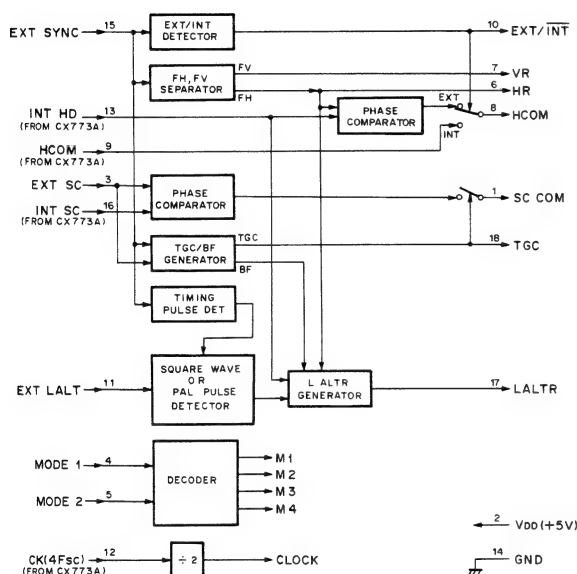
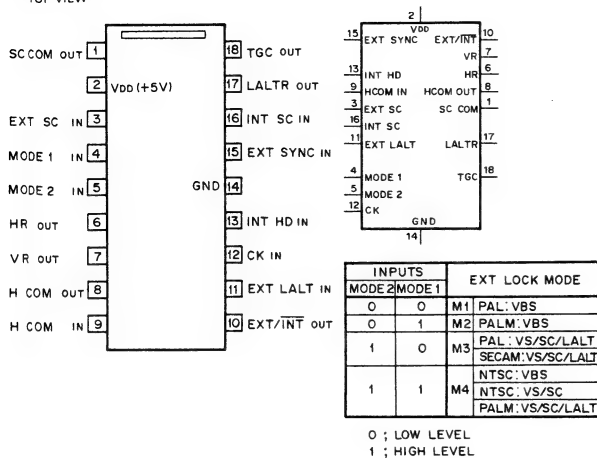
NTSC (FIELD 1, 3)

P: PAL, SECAM
N: NTSC, PALM

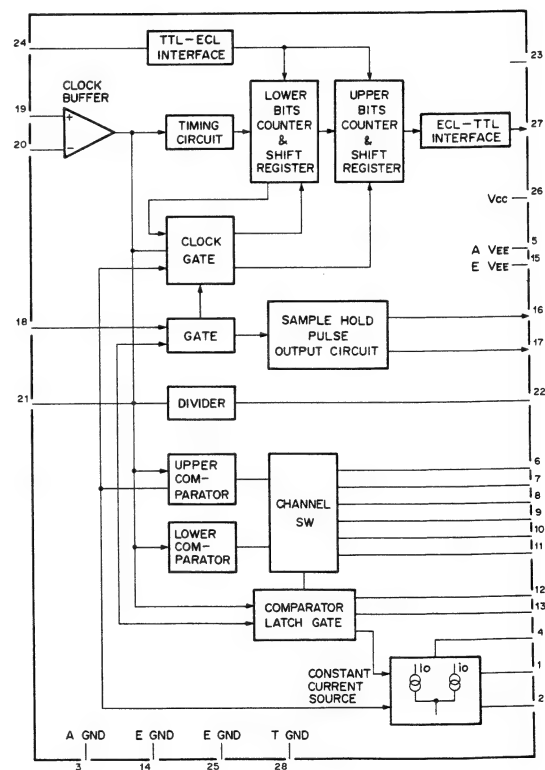
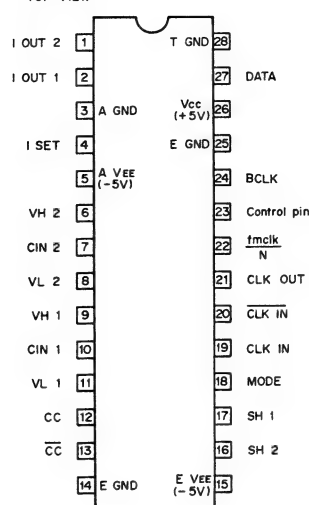
NTSC (FIELD 2, 4)



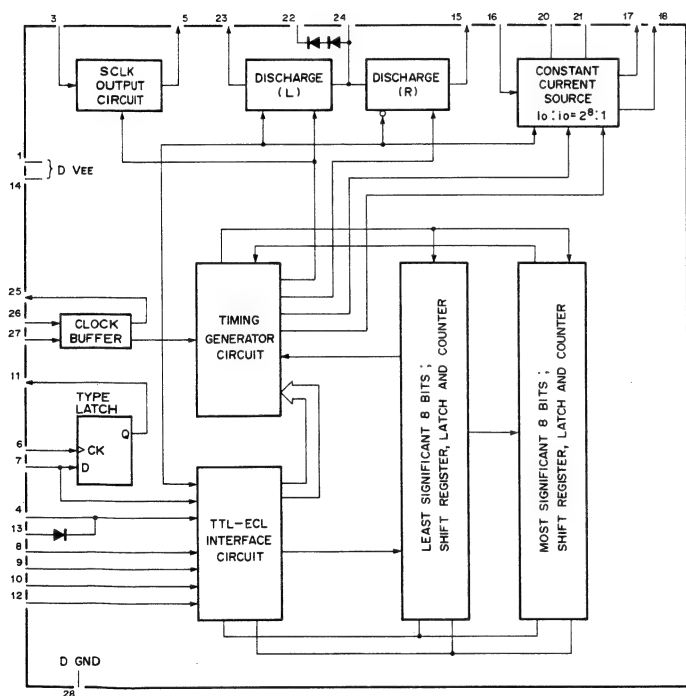
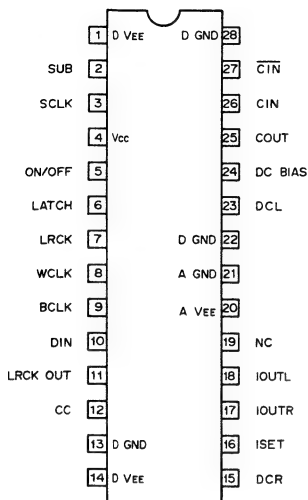
CX7903 (SONY)
C-MOS GENLOCK DRIVER FOR CX773A
— TOP VIEW —



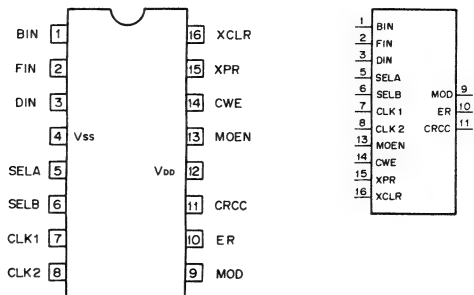
CX20018 (SONY)
16-BIT A/D CONVERTER
— TOP VIEW —



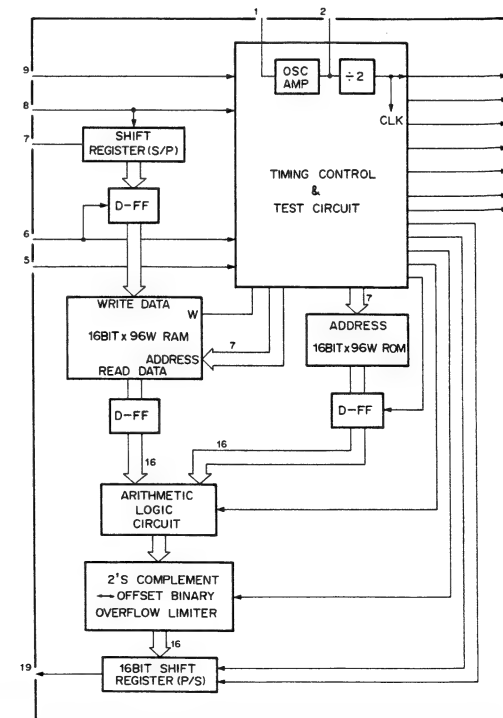
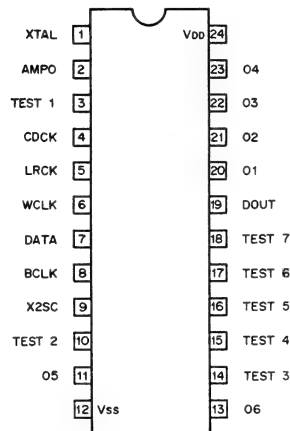
- TOP VIEW -



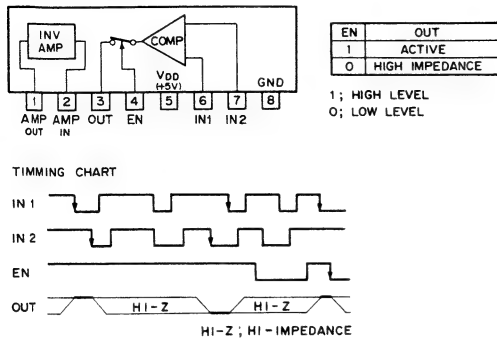
— TOP VIEW —



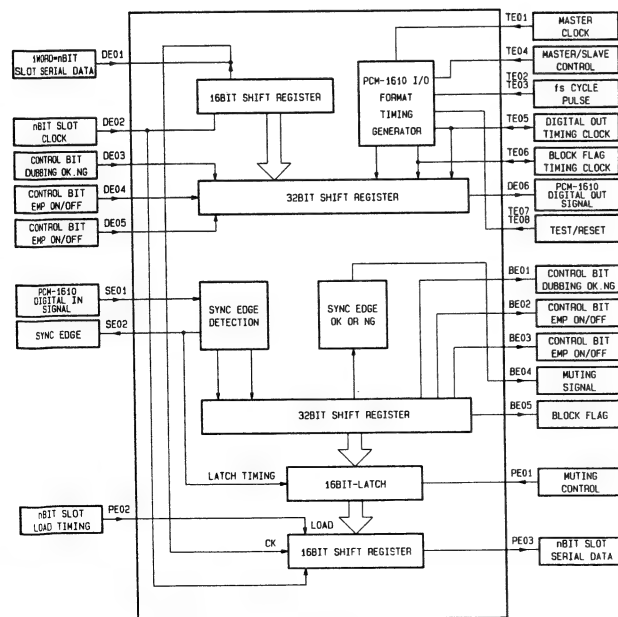
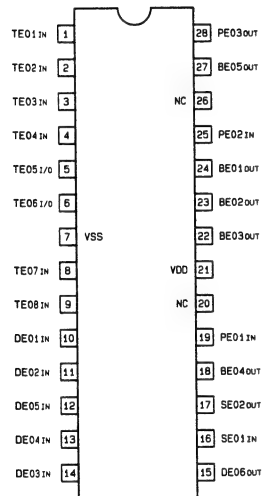
- TOP VIEW -



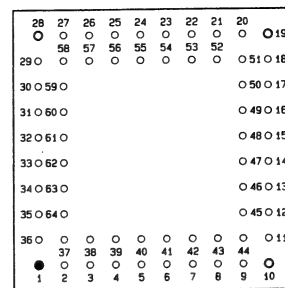
CX23065 (SONY)
N-MOS PHASE COMPARATOR WITH INVERSION AMPLIFIER
— PRINTED SIDE VIEW —



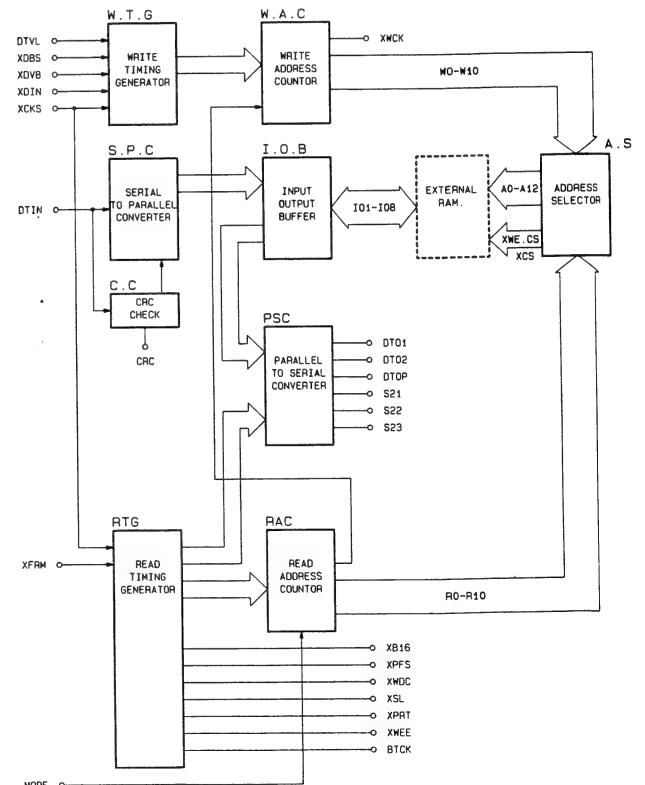
CX23070 (SONY)
C-MOS DIGITAL I/O
— TOP VIEW —



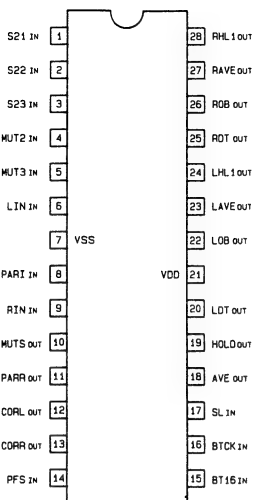
CX23071 (SONY)
C-MOS DECODER-A
— TOP VIEW —



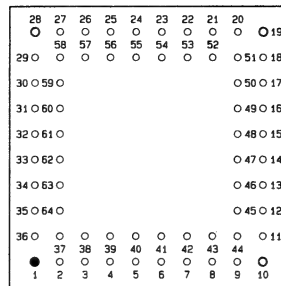
PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL
1	I/O	IO2	17	O	DT02	33	I	TE05	49	O	S21
2	I/O	IO4	18	O	DT0P	34	I	TE03	50	O	S22
3	I/O	IO6	19	O	BTCK	35	I	TE01	51	O	S23
4	I/O	IO8	20	O	XB16	36	I/O	IO1	52	O	XWDC
5	O	A0	21	O	XPFS	37	I/O	IO3	53	O	YSL
6	O	A2	22	O	XPRT	38	I/O	IO5	54	-	VSS
7	O	A4	23	-	N.C.	39	I/O	IO7	55	I	XCKS
8	O	A6	24	-	N.C.	40	-	VSS	56	-	N.C.
9	O	A8	25	I	XFRM	41	O	A1	57	-	N.C.
10	O	A10	26	I	XDIN	42	O	A3	58	I	XOBS
11	O	A9	27	I	DTIN	43	O	A5	59	O	XWCK
12	O	XME	28	I	DTVL	44	O	A7	60	-	N.C.
13	O	CS	29	I	XDVB	45	O	XCS	61	-	VDD
14	-	N.C.	30	O	CRCC	46	-	N.C.	62	-	N.C.
15	O	XWEE	31	I	MODE	47	-	VDD	63	I	TE04
16	O	DT01	32	-	N.C.	48	-	N.C.	64	I	TE02



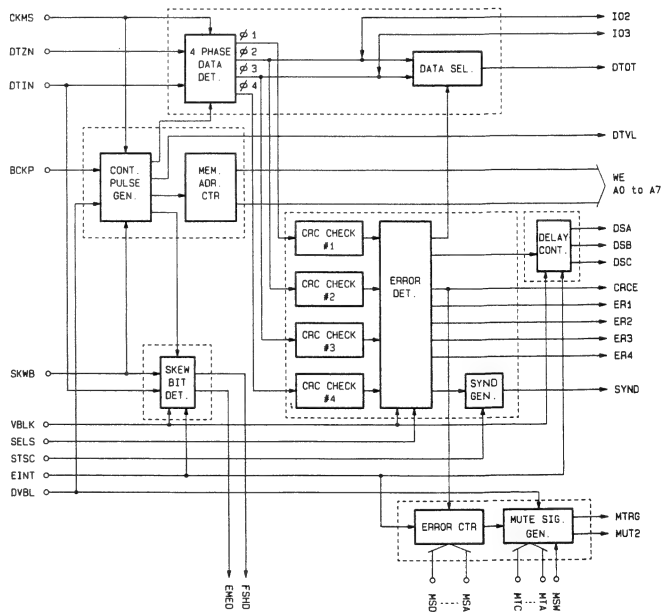
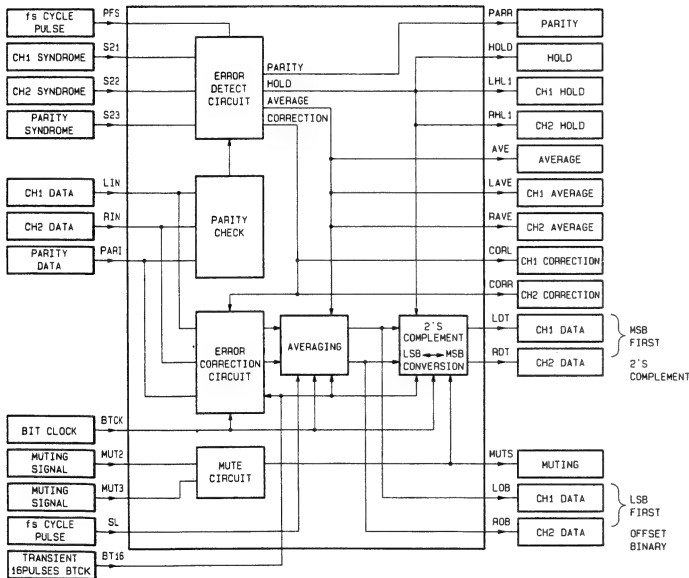
CX23072 (SONY)
C-MOS DECODER-8
— TOP VIEW —



CX23073A (SONY)
C-MOS DATA SEPARATOR
— TOP VIEW —



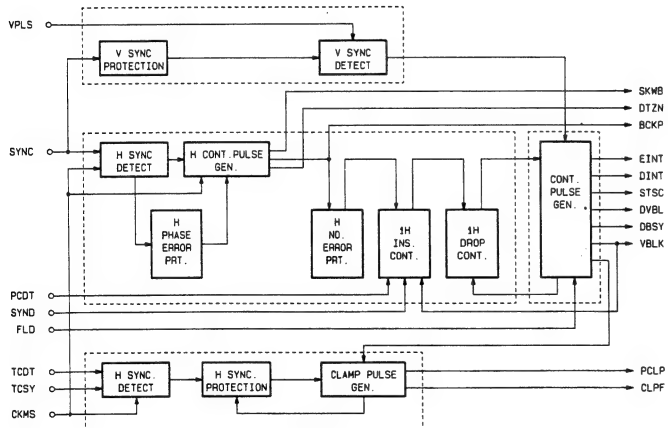
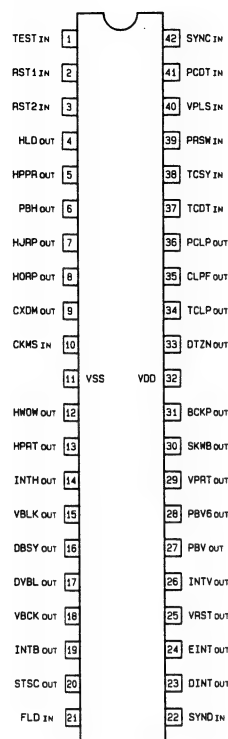
PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL	PIN NO.	I/O	SYMBOL
1	I/O	IO3	17	O	ER3	33	I	MSSEL	49	O	DTCK
2	I/O	IO2	18	O	ER2	34	I	MTA	50	O	SELO
3	O	A0	19	O	ER1	35	I	MTB	51	I	SELS
4	O	A1	20	O	DSC	36	I	MTC	52	O	MTRG
5	-	N.C.	21	O	DSB	37	I	MSD	53	O	MUT2
6	O	A2	22	O	DSA	38	I	MSA	54	-	VSS
7	O	A3	23	I	CKMS	39	I	MSB	55	O	CRCK
8	O	A4	24	I	DTIN	40	-	VSS	56	O	DTA0
9	O	A5	25	I	DTZN	41	I	MSC	57	O	DTDL
10	O	A6	26	I	BCKP	42	I	MSW	58	O	SKWC
11	O	A7	27	I	SKWB	43	O	EMPH	59	O	SYND
12	O	WE	28	I	STSC	44	O	FSIO	60	I	MIN
13	O	DTOT	29	I	VBK	45	O	SKW3	61	-	VDD
14	O	DTVL	30	I	EINT	46	O	SKW4	62	-	N.C.
15	O	CRCE	31	I	DVBL	47	-	VDD	63	I	RSET
16	O	ER4	32	-	N.C.	48	O	FSHD	64	I	TEST



CX23074 (SONY)

C-MOS SYNC SEPARATOR

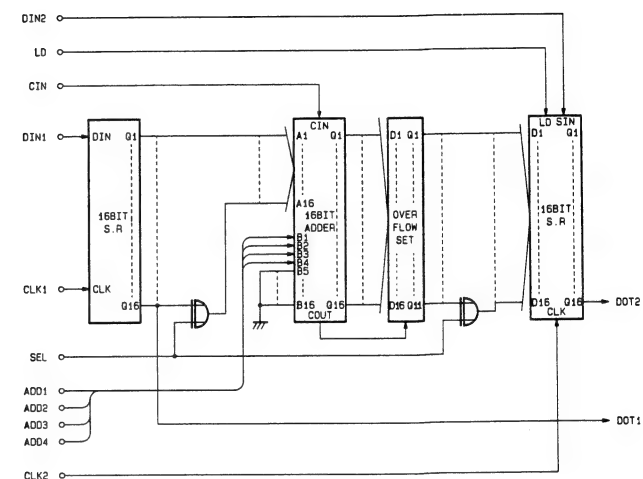
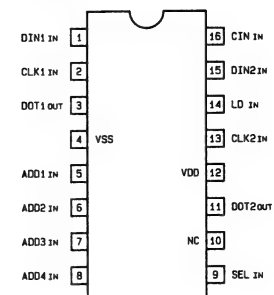
— TOP VIEW —



CXD1027P (SONY)

C-MOS BIT RATE CONVERTER

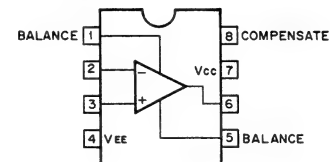
— TOP VIEW —



HA7-2525 (HARRIS)

OPERATIONAL AMPLIFIER

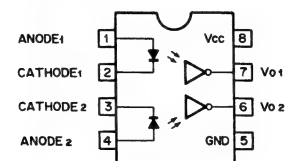
— TOP VIEW —



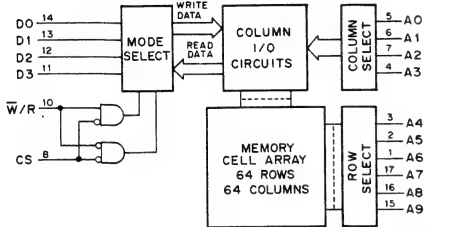
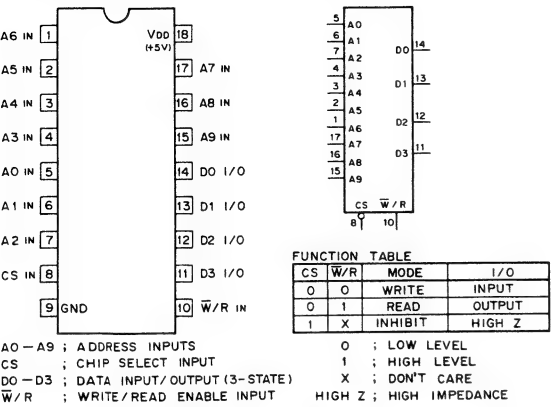
HCPL-2630 (HP)

PHOTO COUPLER

— TOP VIEW —

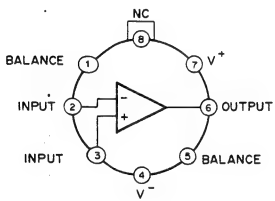


HM6148HP-45 (HITACHI)
C-MOS 4096-BIT (1024x4) STATIC RAM WITH 3-STATE OUTPUT
— TOP VIEW —

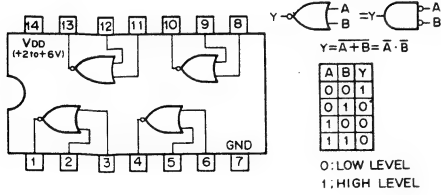


TYPE	-45	-55	-70	L-55	L-70	HP-45
ADDRESS ACCESS TIME (MAX)	45nS	55nS	70nS	55nS	70nS	45nS
CHIP SELECT ACCESS TIME (MAX)	20nS	25nS	30nS	25nS	30nS	45nS
Icc (MAX)	180mA	180mA	180mA	125mA	125mA	80mA

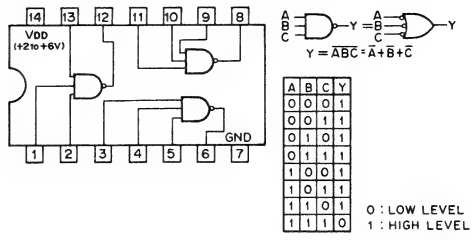
LF356H (N.S.)
OPERATIONAL AMPLIFIER
— TOP VIEW —



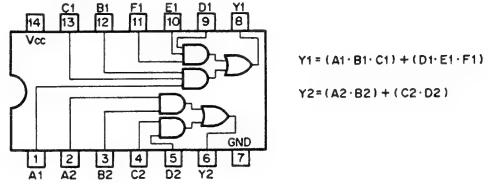
MC74HC02N (MOTOROLA)
C-MOS 2-INPUT POSITIVE-NOR GATE
— TOP VIEW —



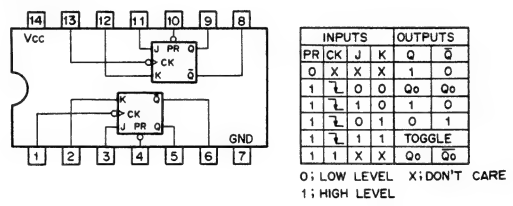
MC74HC10N (MOTOROLA)
C-MOS 3-INPUT NAND GATE
— TOP VIEW —



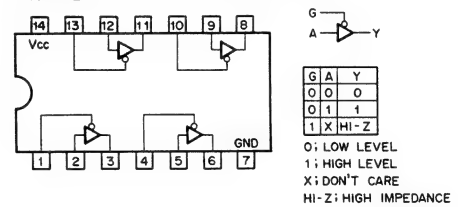
MC74HC58 (MOTOROLA)
C-MOS 2-WIDE 2-INPUT / 2-WIDE 3-INPUT AND-OR GATE
— TOP VIEW —



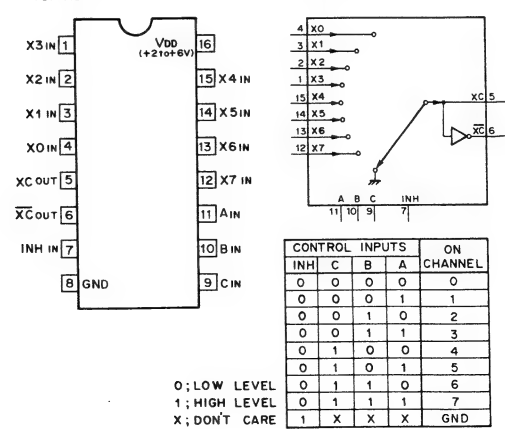
MC74HC113N (MOTOROLA)
C-MOS DUAL J-K FLIP FLOP WITH PRESET
— TOP VIEW —



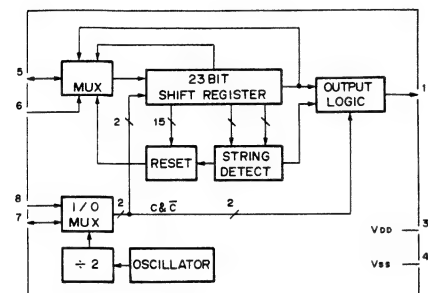
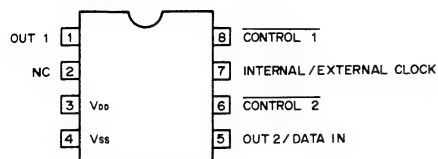
MC74HC125N (MOTOROLA)
C-MOS BUS BUFFER GATES WITH 3-STATE OUTPUT
— TOP VIEW —



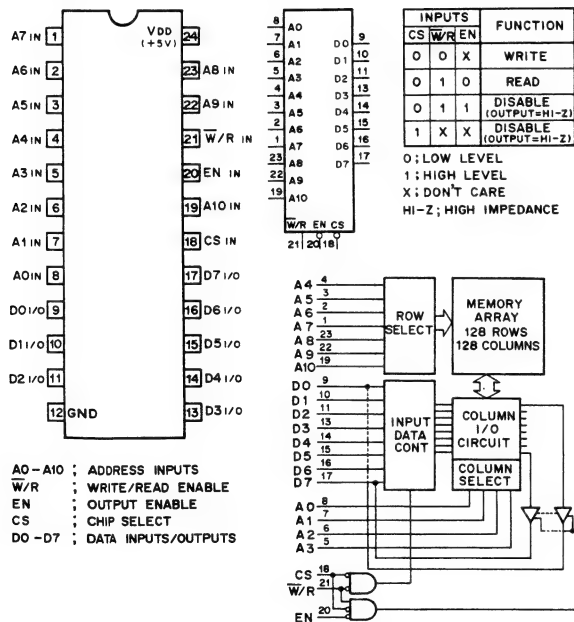
MC74HC151N (MOTOROLA)
C-MOS 8-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER
— TOP VIEW —



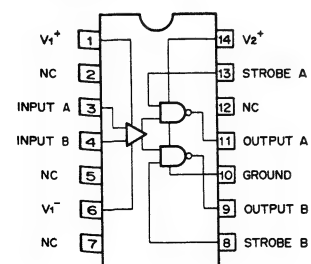
MM5437N (N.S.)
DIGITAL NOISE SOURCE
- TOP VIEW -



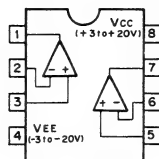
MSM5128-15RS (OKI) ¹ (ACCESS TIME = 150 nS)
C-MOS 16384(2048x8)-BIT HIGH SPEED STATIC RAM
— TOP VIEW —



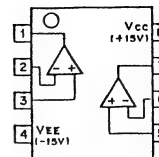
NE529N (SIGNETICS)
VOLTAGE COMPARATOR
-TOP VIEW-



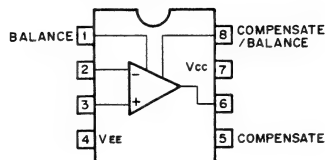
NE5532P (TI)
LOW NOISE OPERATIONAL AMPLIFIER
— TOP VIEW —



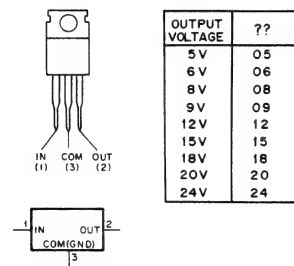
NJM4560DX (JRC)
OPERATIONAL AMPLIFIER
— TOP VIEW —



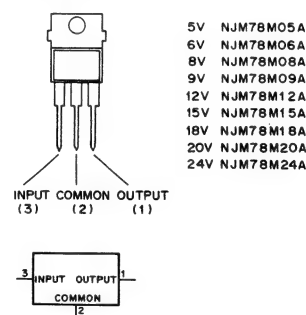
NE5534P (TI)
OPERATIONAL AMPLIFIER
— TOP VIEW —



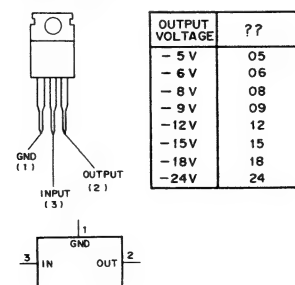
NJM7805A (JRC)
POSITIVE VOLTAGE REGULATOR (1A)
— SIDE VIEW —



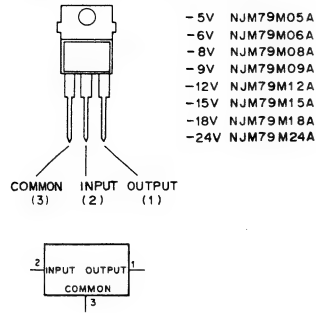
NJM78M05A (JRC)
POSITIVE VOLTAGE REGULATOR (500mA)
- FRONT VIEW -



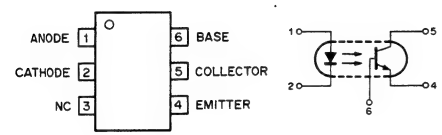
NJM79 79A (JRC)
NEGATIVE VOLTAGE REGULATOR (1A)
— SIDE VIEW —



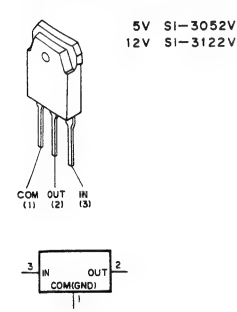
NJM79M ? ?A (JRC)
NEGATIVE VOLTAGE REGULATOR (500mA)
— FRONT VIEW —



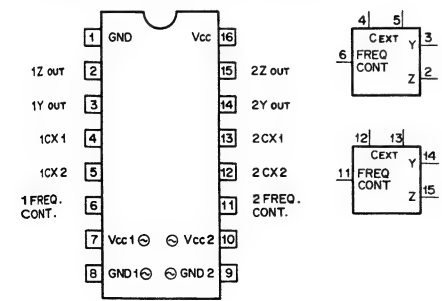
PS2003B (NEC)
PHOTO COUPLER
— TOP VIEW —



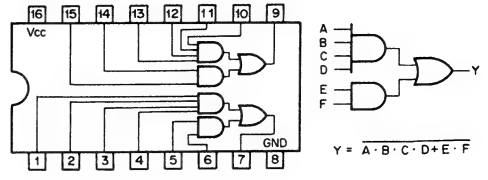
SI-3052V (SANKEN)
POSITIVE VOLTAGE REGULATOR (2A)



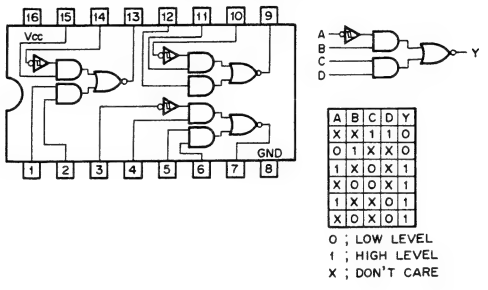
SN74LS625 (TI)
TTL DUAL VOLTAGE-CONTROLLED OSCILLATORS
— TOP VIEW —



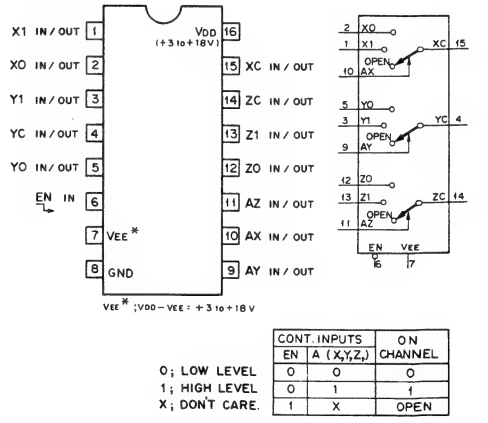
SN75121 (TI)
DUAL LINE DRIVER AND TRIPLE LINE RECEIVER
— TOP VIEW —



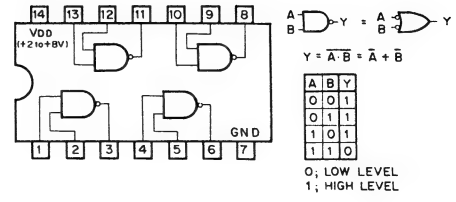
SN75124 (TI)
DUAL LINE DRIVER AND TRIPLE LINE RECEIVER
— TOP VIEW —



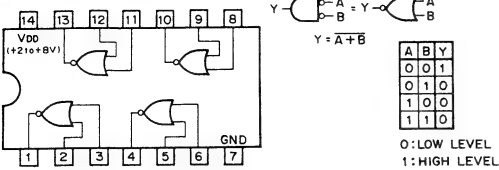
TC4053BP (TOSHIBA)
C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —



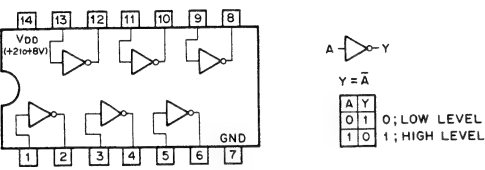
TC40H000P (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —



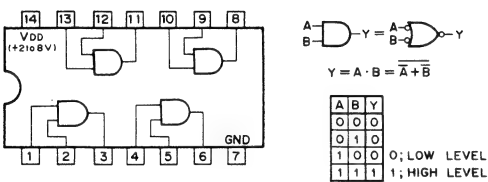
TC40H002P (TOSHIBA)
C-MOS 2-INPUT NOR GATE
— TOP VIEW —



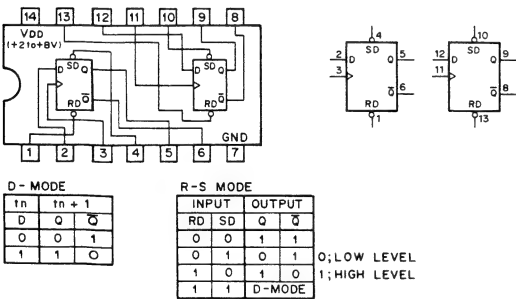
TC40H004P (TOSHIBA)
C-MOS INVERTER
— TOP VIEW —



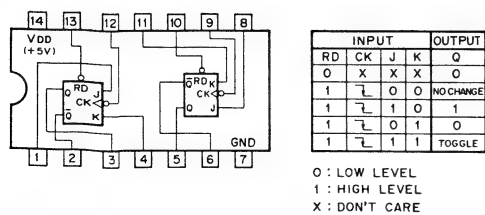
TC40H008P (TOSHIBA)
C-MOS 2-INPUT POSITIVE-AND GATE
— TOP VIEW —



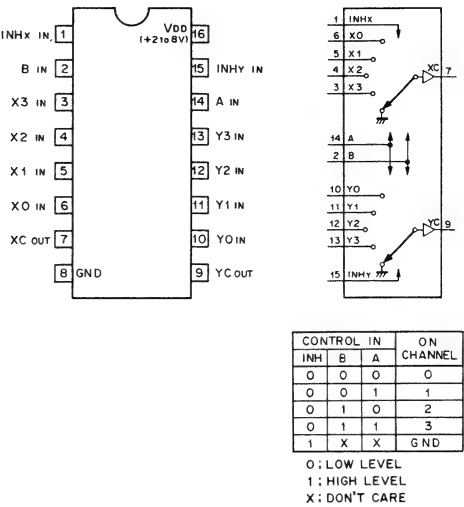
TC40H074P (TOSHIBA)
C-MOS HIGH SPEED D-TYPE FLIP-FLOP WITH DIRECT SET/RESET
— TOP VIEW —



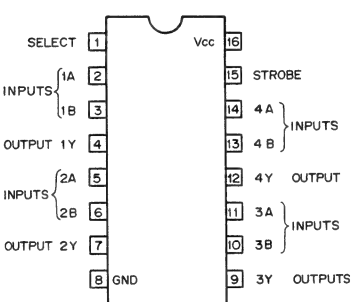
TC40H107AP (TOSHIBA)
C-MOS DUAL J-K FLIP-FLOPS
— TOP VIEW —



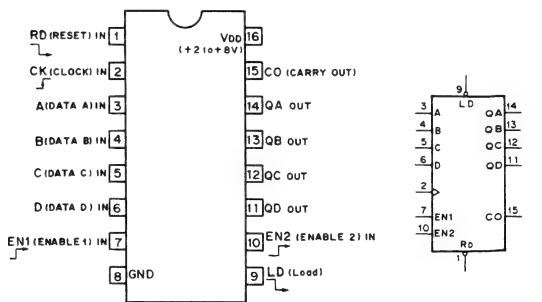
TC40H153P (TOSHIBA)
C-MOS 4-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER
— TOP VIEW —



TC40H158P (TOSHIBA)
C-MOS QUAD 2-TO 1-LINE DATA SELECTORS / MULTIPLEXERS
— TOP VIEW —



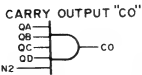
TC40H161P (TOSHIBA)
C-MOS PRESETTABLE SYNCHRONOUS 4-BIT BINARY COUNTER
— TOP VIEW —



MODE SELECTION

CONTROL INPUTS				MODE
Rd	LD	EN1	EN2	
0	X	X	X	RESET (ASYNCHRONOUS)
1	0	X	X	PRESET (SYNCHRONOUS)
1	1	0	X	NO COUNT
1	1	X	0	NO COUNT
1	1	1	1	COUNT

0: LOW LEVEL
1: HIGH LEVEL
X: DON'T CARE

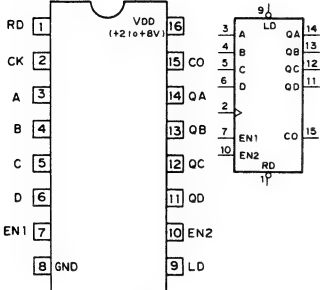


CO IS HIGH WHEN EN2 INPUT IS HIGH AND COUNT IS "15".

COUNT SEQUENCE

COUNT	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

TC40H163P (TOSHIBA)
C-MOS PRESETTABLE SYNCHRONOUS 4-BIT BINARY COUNTER
— TOP VIEW —



CARRY OUTPUT "CO"



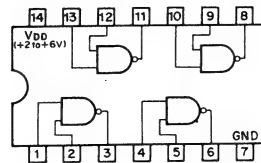
CO GOES HIGH WHEN EN2 IS HIGH
AND COUNT IS "15"

MODE SELECTION				MODE
RD	LD	EN1	EN2	
0	X	X	X	RESET (SYNCHRONOUS)
1	0	X	X	PRESET (SYNCHRONOUS)
1	1	0	X	NO COUNT
1	1	X	0	NO COUNT
1	1	1	1	COUNT

COUNT SEQUENCE		OUTPUTS			
COUNT	QD	QC	QB	QA	
0	0	0	0	0	
1	0	0	0	1	
2	0	0	1	0	
3	0	0	1	1	
4	0	1	0	0	
5	0	1	0	1	
6	0	1	1	0	
7	0	1	1	1	
8	1	0	0	0	
9	1	0	0	1	
10	1	0	1	0	
11	1	0	1	1	
12	1	1	0	0	
13	1	1	0	1	
14	1	1	1	0	
15	1	1	1	1	

0: LOW LEVEL
1: HIGH LEVEL
X: DON'T CARE

TC74HC00P (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —

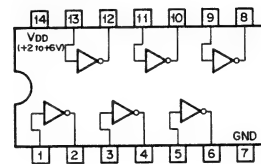


$$Y = A \cdot B = \overline{\overline{A} \cdot \overline{B}}$$

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0: LOW LEVEL
1: HIGH LEVEL

TC74HC04P (TOSHIBA)
C-MOS INVERTER
— TOP VIEW —

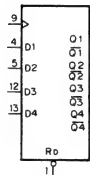
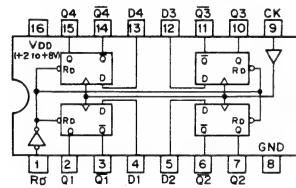


$$Y = \overline{A}$$

A	Y
0	1
1	0

0: LOW LEVEL
1: HIGH LEVEL

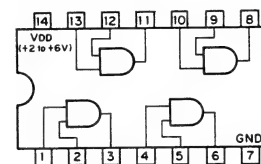
TC40H175P (TOSHIBA)
C-MOS D-TYPE FLIP-FLOP WITH CLEAR
— TOP VIEW —



RD	CK	D	Q	Q
0	X	X	0	1
1	1	1	1	0
1	1	0	0	1
1	0	X	Q0	Q0

0: LOW LEVEL
1: HIGH LEVEL
X: DON'T CARE

TC74HC08P (TOSHIBA)
C-MOS 2-INPUT AND GATE
— TOP VIEW —

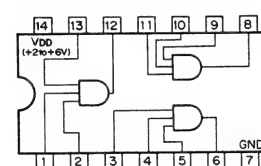


$$Y = A \cdot B = \overline{\overline{A} \cdot \overline{B}}$$

A	B	Y
0	0	0
0	1	0
1	0	0
1	1	1

0: LOW LEVEL
1: HIGH LEVEL

TC74HC11P (TOSHIBA)
C-MOS 3-INPUT AND GATE
— TOP VIEW —

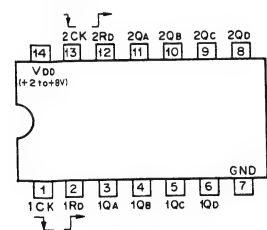


$$Y = A \cdot B \cdot C = \overline{\overline{A} \cdot \overline{B} \cdot \overline{C}}$$

A	B	C	Y
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

0: LOW LEVEL
1: HIGH LEVEL

TC40H393P (TOSHIBA)
C-MOS 4-BIT BINARY COUNTER
— TOP VIEW —

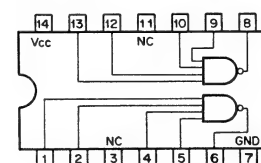


COUNT SEQUENCE		OUTPUTS			
COUNT	Qd	Qc	Qb	Qa	
0	0	0	0	0	
1	0	0	0	1	
2	0	0	1	0	
3	0	0	1	1	
4	0	1	0	0	
5	0	1	0	1	
6	0	1	1	0	
7	0	1	1	1	
8	1	0	0	0	
9	1	0	0	1	
10	1	0	1	0	
11	1	0	1	1	
12	1	1	0	0	
13	1	1	0	1	
14	1	1	1	0	
15	1	1	1	1	

RESET/COUNT FUNCTION		OUTPUTS			
RD	Qd	Qc	Qb	Qa	
1	0	0	0	0	
0					COUNT

0: LOW LEVEL
1: HIGH LEVEL

TC74HC20P (TOSHIBA)
C-MOS 4-INPUT POSITIVE-NAND GATE
— TOP VIEW —

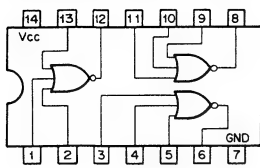


$$Y = A \cdot B \cdot C \cdot D = \overline{\overline{A} \cdot \overline{B} \cdot \overline{C} \cdot \overline{D}}$$

A	B	C	D	Y
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

0: LOW LEVEL
1: HIGH LEVEL

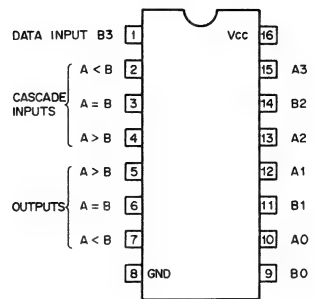
TC74HC27P (TOSHIBA)
C-MOS 3-INPUT POSITIVE-NOR GATE
— TOP VIEW —



$$Y = \overline{A+B+C} = \overline{A} \cdot \overline{B} \cdot \overline{C}$$

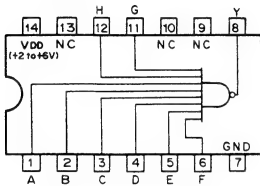
A	B	C	Y
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	0

TC74HC85P (TOSHIBA)
C-MOS 4-BIT MAGNITUDE COMPARATOR
— TOP VIEW —



A0	A1	A2	A3	B0	B1	B2	B3	Y
0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	1	0
0	0	0	0	0	1	0	0	0
0	0	0	0	0	1	0	1	0
0	0	0	0	1	0	0	0	0
0	0	0	0	1	0	0	1	0
0	0	0	0	1	1	0	0	0
0	0	0	0	1	1	0	1	0

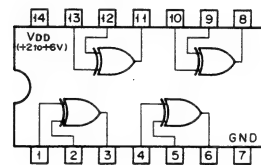
TC74HC30P (TOSHIBA)
C-MOS 8-INPUT NAND GATE
— TOP VIEW —



$$Y = \overline{A \cdot B \cdot C \cdot D \cdot E \cdot F \cdot G \cdot H} = \overline{A} + \overline{B} + \overline{C} + \overline{D} + \overline{E} + \overline{F} + \overline{G} + \overline{H}$$

$$Y = \overline{A \cdot B \cdot C \cdot D \cdot E \cdot F \cdot G \cdot H} = \overline{A} + \overline{B} + \overline{C} + \overline{D} + \overline{E} + \overline{F} + \overline{G} + \overline{H}$$

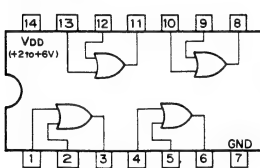
TC74HC86P (TOSHIBA)
C-MOS EXCLUSIVE OR GATE
— TOP VIEW —



$$Y = \overline{A} \cdot B + A \cdot \overline{B}$$

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

TC74HC32P (TOSHIBA)
C-MOS 2-INPUT OR GATE
— TOP VIEW —

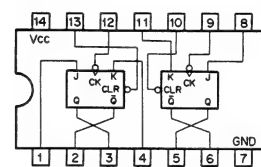


$$Y = A + B = \overline{\overline{A} \cdot \overline{B}}$$

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	1

0: LOW LEVEL
1: HIGH LEVEL

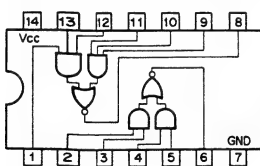
TC74HC107P (TOSHIBA)
C-MOS DUAL J-K FLIP FLOP WITH CLEAR
— TOP VIEW —



CL	R	J	K	Q	Q-bar
0	X	X	X	0	1
1	0	0	0	Q0	Q0-bar
1	0	1	0	1	0
1	0	0	1	0	1
1	0	1	1	TOGGLE	TOGGLE
1	1	X	X	Q0	Q0-bar

0: LOW LEVEL X: DON'T CARE
1: HIGH LEVEL

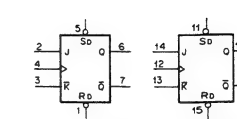
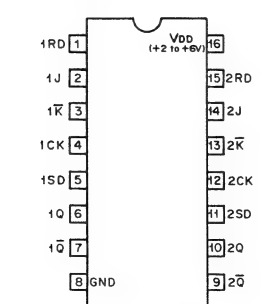
TC74HC51P (TOSHIBA)
C-MOS 2-WIDE 2-INPUT/3-INPUT AND-OR-INVERT GATE
— TOP VIEW —



$$Y = \overline{(A \cdot B) + (C \cdot D)}$$

$$Y = \overline{(A \cdot B \cdot C) + (D \cdot E \cdot F)}$$

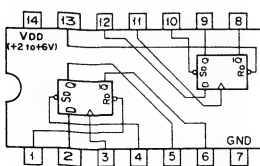
TC74HC109P (TOSHIBA)
C-MOS J-K FLIP-FLOP WITH DIRECT SET/RESET
— TOP VIEW —



S	R	J	K	Qn	Qn+1
0	1	X	X	1	0
1	0	X	X	0	1
0	0	X	X	1*	1*
1	1	0	0	Qn	Qn
1	1	0	0	Qn	Qn
1	1	0	0	Qn	Qn

0: LOW LEVEL
1: HIGH LEVEL
X: DON'T CARE
*: NONSTABLE

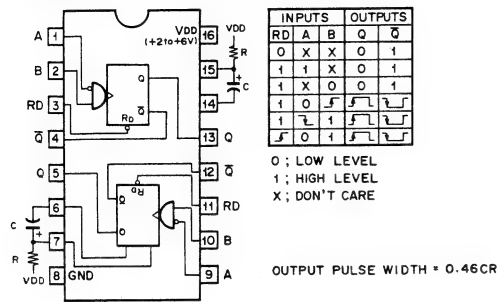
TC74HC74P (TOSHIBA)
C-MOS D-TYPE FLIP FLOP WITH DIRECT SET/RESET
— TOP VIEW —



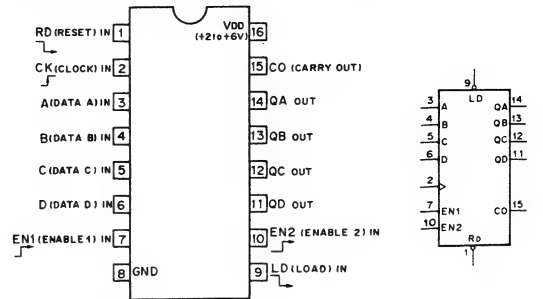
S	R	D	Qn	Qn+1
0	1	X	1	0
1	0	X	0	1
0	0	X	1*	1*
1	1	0	Qn	Qn
1	1	0	Qn	Qn
1	1	0	Qn	Qn

0: LOW LEVEL
1: HIGH LEVEL
X: DON'T CARE
1*: NONSTABLE

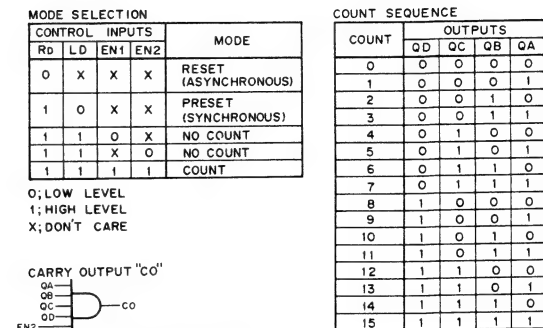
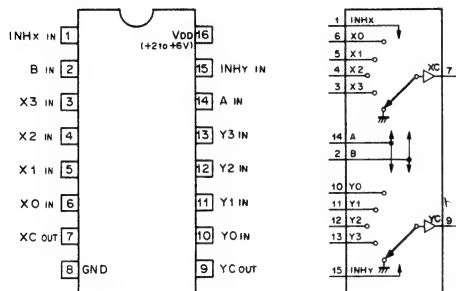
TC74HC123P (TOSHIBA)
C-MOS 4-RETRIGGERABLE MONOSTABLE MULTIVIBRATOR
— TOP VIEW —



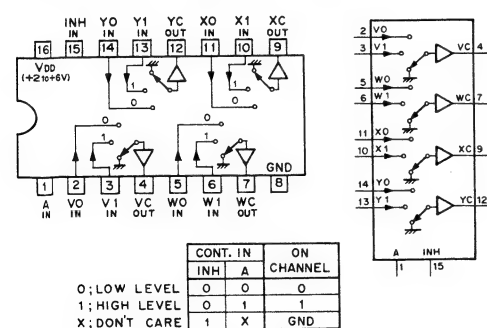
TC74HC161P (TOSHIBA)
C-MOS SYNCHRONOUS PRESETTABLE 4-BIT BINARY COUNTER
— TOP VIEW —



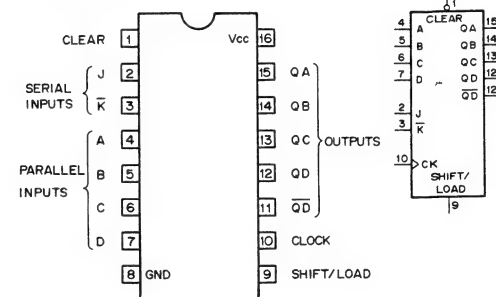
TC74HC153P (TOSHIBA)
C-MOS 4-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER
— TOP VIEW —



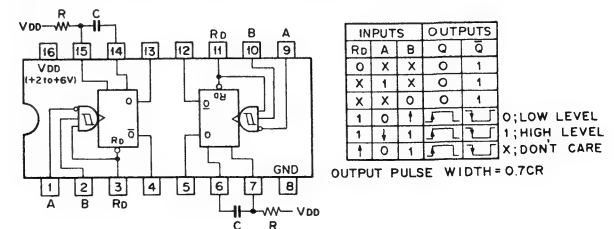
TC74HC157P (TOSHIBA)
C-MOS 2-LINE-TO-1-LINE DATA SELECTOR/MULTIPLEXER
— TOP VIEW —



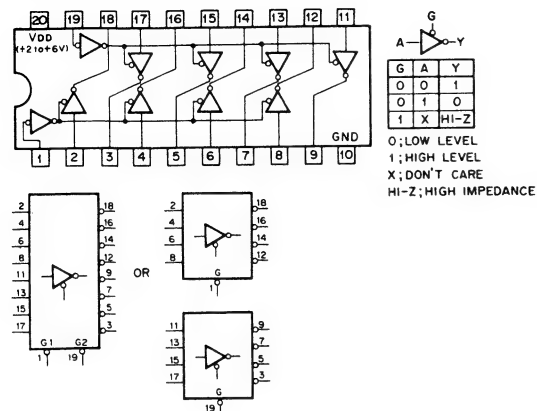
TC74HC195P (TOSHIBA)
C-MOS 4-BIT PARALLEL ACCESS SHIFT REGISTER
— TOP VIEW —



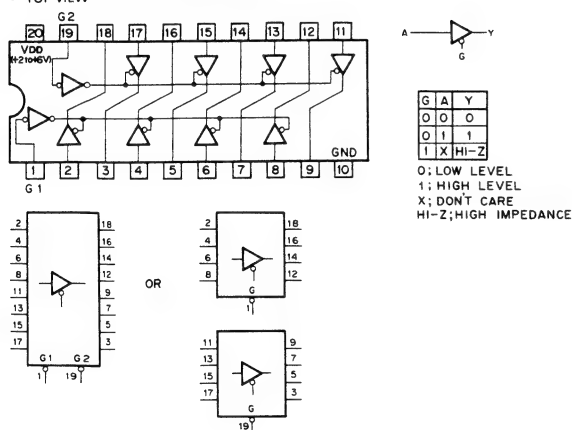
TC74HC221P (TOSHIBA)
C-MOS MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT
— TOP VIEW —



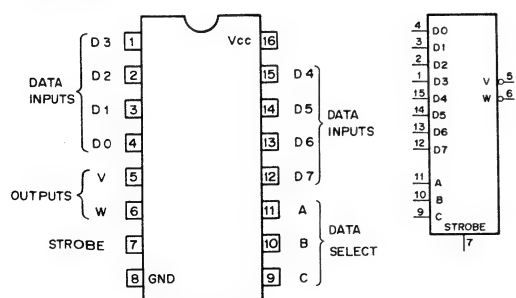
TC74 HC240P (TOSHIBA)
C-MOS 3-STATE INVERTER/LINE DRIVER
— TOP VIEW —



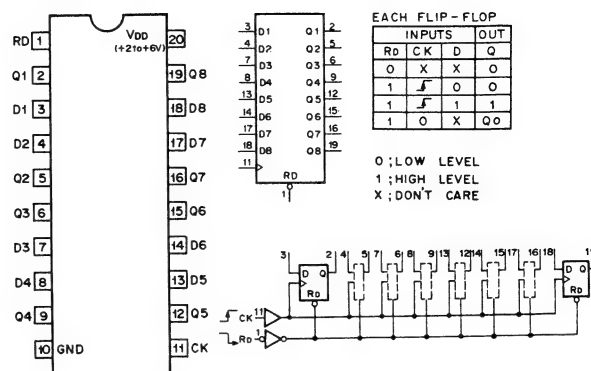
TC74HC244P (TOSHIBA)
C-MOS BUS BUFFER WITH 3-STATE OUTPUT
— TOP VIEW —



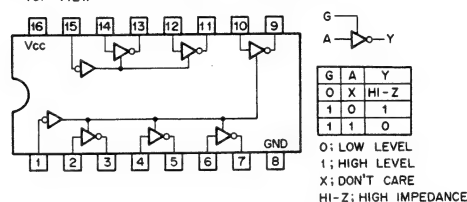
TC74HC251P (TOSHIBA)
C-MOS DATA SELECTOR / MULTIPLEXER
— TOP VIEW —



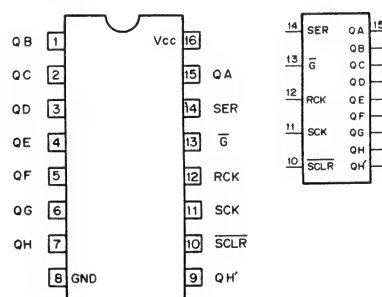
TC74HC273P (TOSHIBA)
C-MOS D-TYPE FLIP-FLOP WITH RESET
— TOP VIEW —



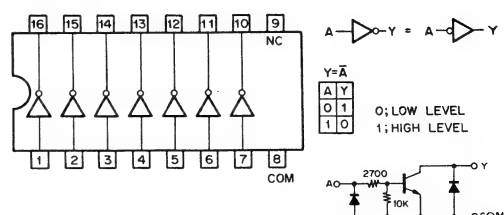
TC74HC368P (TOSHIBA)
C-MOS HEX BUS DRIVER, WITH 3-STATE OUTPUTS
- TOP VIEW -



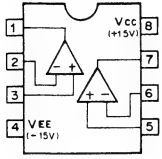
TC74HC595P (TOSHIBA)
C-MOS 8-BIT SHIFT REGISTER/LATCHES
— TOP VIEW —



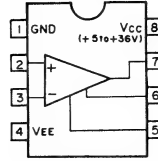
TD62503P (TOSHIBA)
DRIVER
-TOP VIEW-



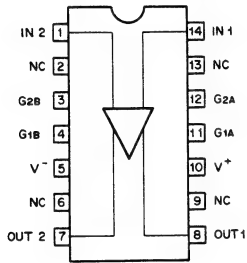
TL072ACP (TI)
OPERATIONAL AMPLIFIER
(LOW-NOISE, JFET-INPUT)
— TOP VIEW —



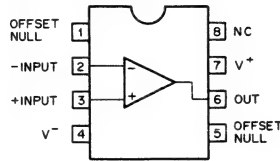
μPC311C (NEC)
VOLTAGE COMPARATOR
— TOP VIEW —



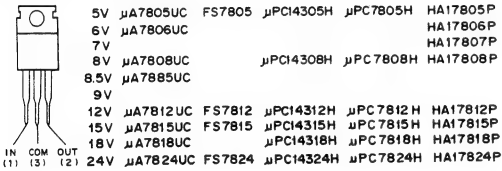
μA733DC (FSC)
DIFFERENTIAL VIDEO AMPLIFIER
— TOP VIEW —



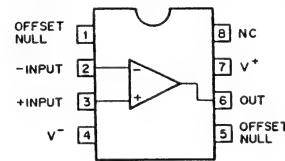
μPC741C (NEC)
OPERATIONAL AMPLIFIER
— TOP VIEW —



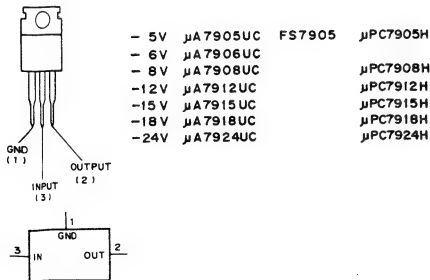
μA78?7UC (FSC)
POSITIVE VOLTAGE REGULATOR (1A)



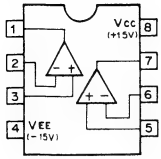
μPC811C (NEC)
HIGH STABILITY OPERATIONAL AMPLIFIER



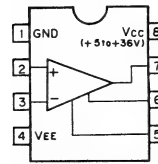
μA79?7UC (FSC)
NEGATIVE VOLTAGE REGULATOR (1A)



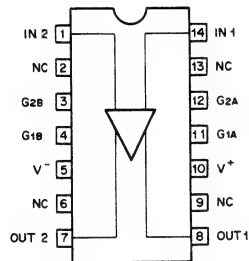
TL072ACP (TI)
OPERATIONAL AMPLIFIER
(LOW-NOISE, JFET-INPUT)
— TOP VIEW —



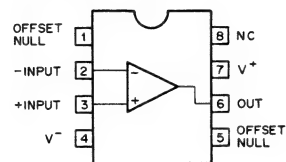
μPC311C (NEC)
VOLTAGE COMPARATOR
— TOP VIEW —



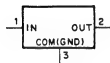
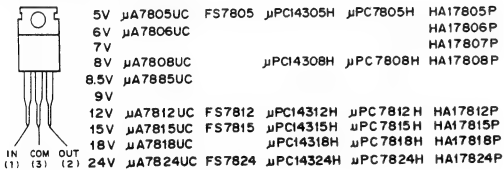
μA733DC (FSC)
DIFFERENTIAL VIDEO AMPLIFIER
— TOP VIEW —



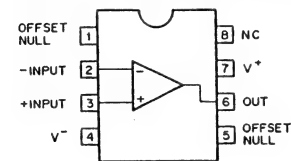
μPC741C (NEC)
OPERATIONAL AMPLIFIER
— TOP VIEW —



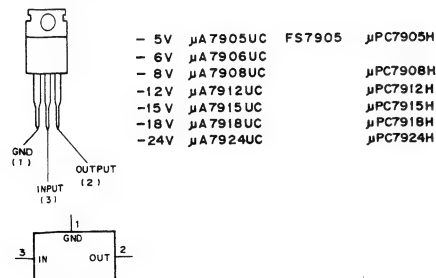
μA7877UC (FSC)
POSITIVE VOLTAGE REGULATOR (1A)



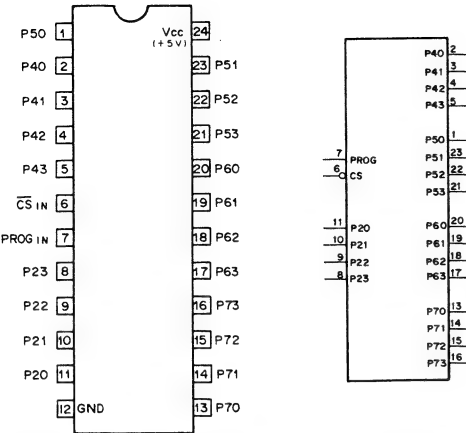
μPC811C (NEC)
HIGH STABILITY OPERATIONAL AMPLIFIER



μA7977UC (FSC)
NEGATIVE VOLTAGE REGULATOR (1A)



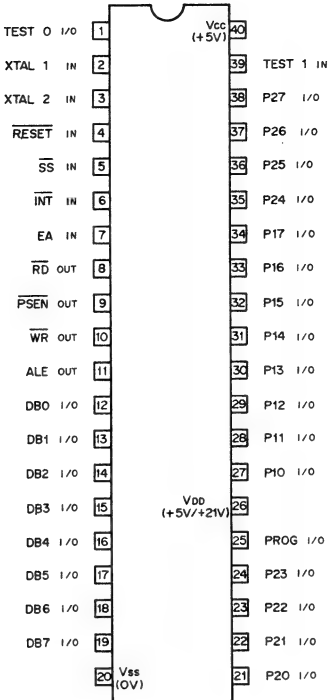
μPD8243C (NEC)
N-MOS I/O PORT EXPANDER
— TOP VIEW —



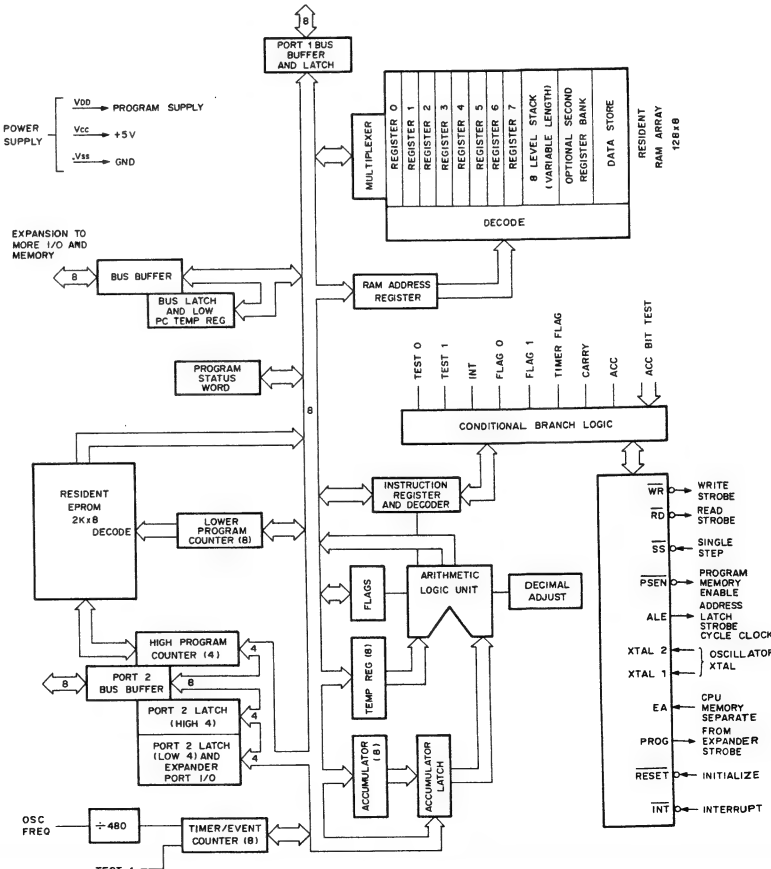
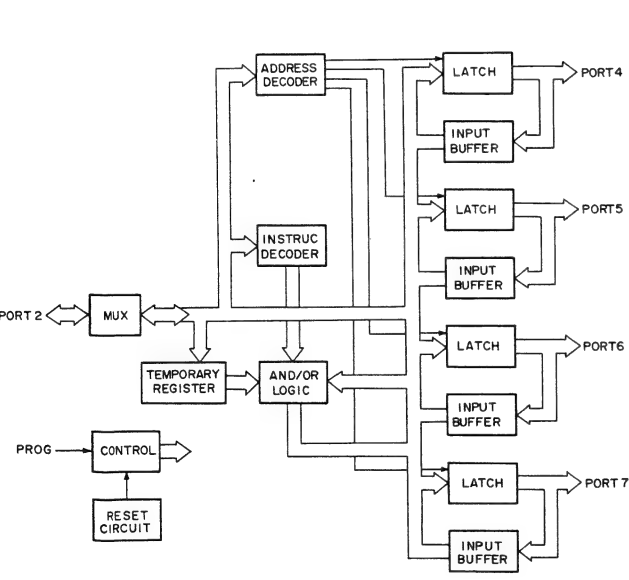
CONTROL AND PORT ADDRESSING				
P23	P22	P21	P20	PORT CONTROL
0	0	0	0	4
0	0	0	1	5
0	0	1	0	6
0	0	1	1	7
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	0	0	0	4
1	0	0	1	5
1	0	1	0	6
1	0	1	1	7
1	1	0	0	4
1	1	0	1	5
1	1	1	0	6
1	1	1	1	7

PROG; PROGRAM PULSE INPUT
CS; CHIP SELECT INPUT
P20~P23; I/O PORT 2 (FOR CPU)
P40~P43; I/O PORT 4
P50~P53; I/O PORT 5
P60~P63; I/O PORT 6
P70~P73; I/O PORT 7

μPD8749HD (NEC)
N-MOS 8-BIT MICROCOMPUTER
— TOP VIEW —



P10~P17; I/O PORT 1
P20~P27; I/O PORT 2
DB0~DB7; DATA BUS
INT; INTERRUPT
RD; READ
WR; WRITE
ALE; ADDRESS LATCH ENABLE
PSEN; PROGRAM STORE ENABLE
SS; SINGLE STEP
EA; EXTERNAL ACCESS
PROG; PROGRAM PULSE
XTAL 1,2; CRYSTAL



SECTION B
BLOCK DIAGRAMS AND CIRCUIT DESCRIPTION

AD-23 基板

AD-23 基板は外部からの2チャンネルのアナログ信号をデジタル信号に変換して、SIF-1 基板へ出力する。AD-23 基板の特徴は、ローパスフィルタに位相補償回路を内蔵させて、16 kHz までの群遅延を $10\mu\text{sec}$ 以内に押えていることである。これにより、実用上、線形位相と呼べる特性を得ている。

アナログ部はINPUT AMP, EMPHASIS AMP, DITHER AMP, LPF, HEADPHONES AMP で構成される。EMPHASIS と DITHER のON/OFF スイッチはAD基板上にあり、それぞれ、SW1 と SW2 である。SW2 をONにすると NOISE SOURCE 回路から、サンプリング間隔に同期した DITHER 信号が出力され、DITHER AMP で、アナログ信号と加算される。

デジタル部ではDEC-15 基板からのタイミングクロックをAD変換に必要なタイミングに作り変えている。CC CONTROL 回路ではWDCK1 よりも1 BITCK 分だけ先行するタイミングのCCクロックを作っている。

AD変換部ではデジタル部で作られたCCクロックに合わせてAD変換を行っている。AD変換部は、AD CONVERTER, OSCILLATOR, SAMPLE HOLD, LIMITER, CURRENT SOURCE, AD OFFSET FEEDBACK で構成される。CCがHIGHのときにSAMPLE HOLD回路は入力信号をつかまえて、CCがLOWになったときに変換を行う。

ヘッドホン用のモニター信号はATT及びHEADPHONES AMPを通過してDA-15基板へ行く。

AD-23 BOARD

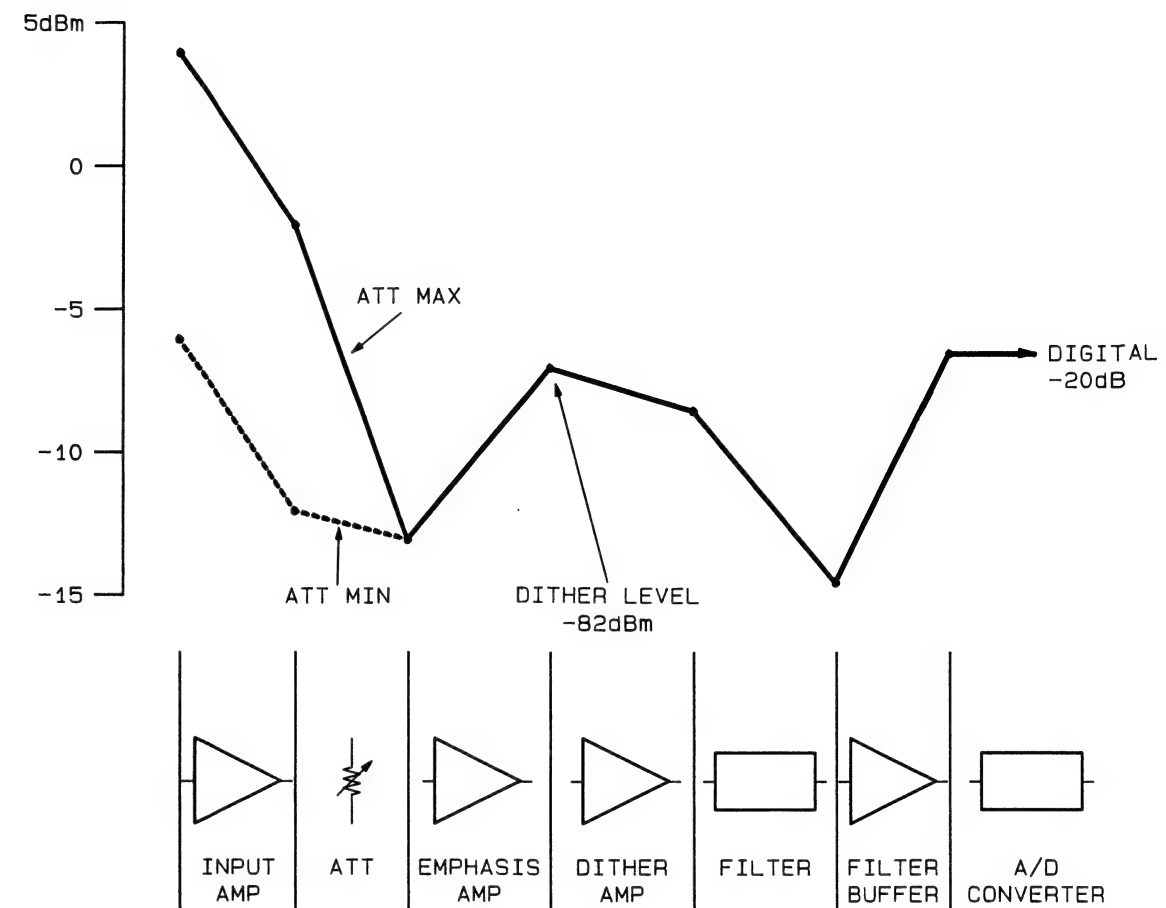
The AD-23 board converts analog signals of two channels to digital signals, which are then outputted to the SIF-1 board. The AD-23 board features a low pass filter containing a phase compensation circuit whose group delay to 16 kHz is within $10\mu\text{sec}$. This enables so called linear phase characteristics to be obtained in practice.

The analog section consists of an input amplifier, emphasis amplifier, dither amplifier, LPF and a headphones amplifier. The ON/OFF switches for the EMPHASIS and DITHER are on the AD board, and are SW1 and SW2 respectively. When SW2 is turned ON, dither signals of each channel synchronized to the sampling interval are generated at the noise source circuit, and these are added to the analog signal in the dither amplifier.

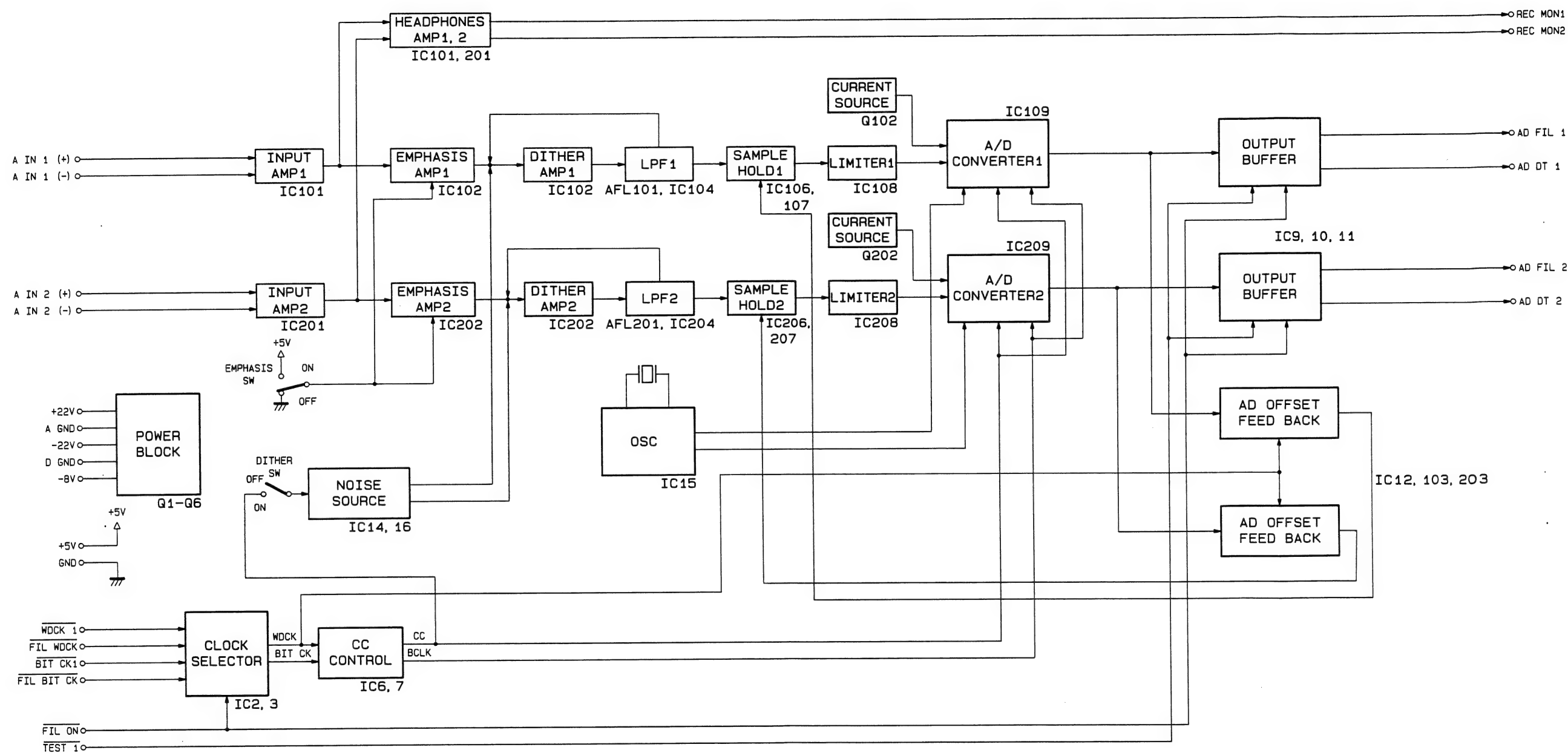
In the digital section, the timing clock from the DEC-15 board is modified to make the timing suitable for AD conversion. In the CC control circuit, a CC clock is produced which is one BITCK ahead of WDCK1.

In the AD conversion section, AD conversion is carried out in accordance with the CC clock produced in the digital section. The AD conversion section consists of AD converter, oscillator, sample and hold, limiter, current source, and AD offset feedback circuits. When the CC clock is high level, the sample-and-hold circuit samples the input signal, and when the CC clock goes low level, conversion starts.

The monitor signals for headphones go to DA-15 board through attenuators and headphones amplifiers.



AD-23 BOARD LEVEL DIAGRAM



AD-23 BOARD BLOCK DIAGRAM

DA-15 基板

DA-15 基板は2チャンネルのデジタル信号をアナログ信号に復元する。DA-15 基板の特徴は、デジタルフィルターを用いてサンプリング周波数を2倍にし、可聴帯域内の量子化ノイズを減らし、さらにローパスフィルターの遮断特性をゆるやかにして可聴帯域内の位相を直線にしていることである。

デジタル部はREFERENCE CLOCK, DATA SELECTOR, DIVIDER, TIMING CONTROL, PHASE COMP & VCO, DIGITAL FILTERで構成される。DIGITAL FILTERに必要なクロックはPHASE COMP & VCOによるPLLで作られている。2チャンネルのデジタルデータはDATA SELECTOR回路で1本のシリアルデータに並べかえられて、DIGITAL FILTER回路へ入力する。DIGITAL FILTER回路からは、データとタイミングクロックがすべて2倍のサンプリング周波数に対応して出力される。

DA変換部ではDIGITAL FILTER回路からのタイミングクロックとデータを受けてアナログ信号に変換する。DAコンバーターのIC101, 201はそれぞれ1個で2チャンネル分の変換を行っており、2倍のサンプリング周波数に対応している。

アナログ部は、LPF, DE-EMPHASIS AMP, LEVEL ADJUST, LINE AMP, HEADPHONES AMP, MONITOR SELECTORで構成される。LPF回路のローパスフィルターは通過域内にリップルを持たない9次のバターワース型で、遮断特性は24 kHzで-3 dB, 64 kHzで-86 dBとなっている。MONITOR SELECTORは、AD-23基板からのモニター信号とDA-15基板のモニター信号を切り換えている。

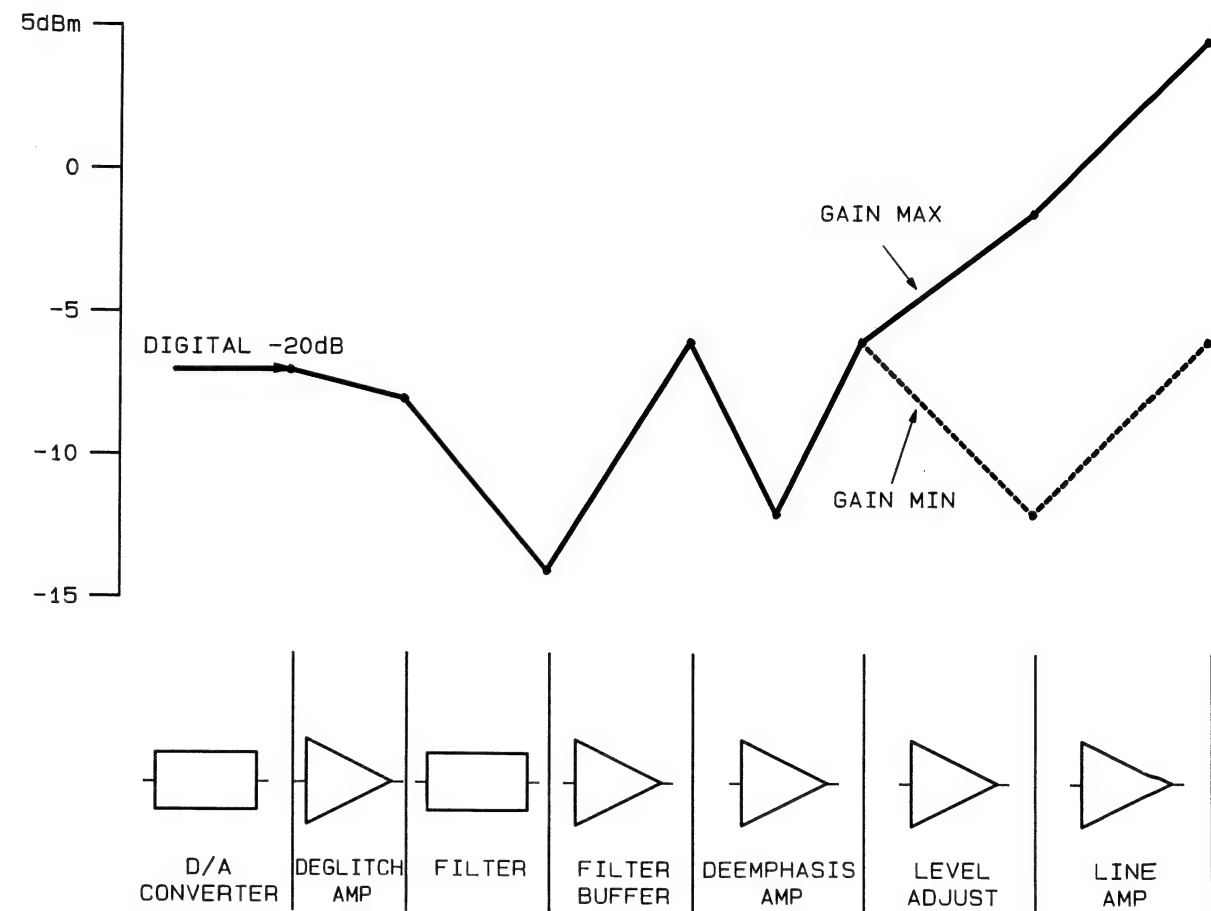
DA-15 BOARD

The DA-15 board restores digital signals of two channels to analog signals. The DA-15 board features a digital filter which doubles the sampling frequency to reduce quantization noise in the audio frequency range, and a low pass filter with moderate cut off characteristics which allows linear phase characteristics in the audio frequency range.

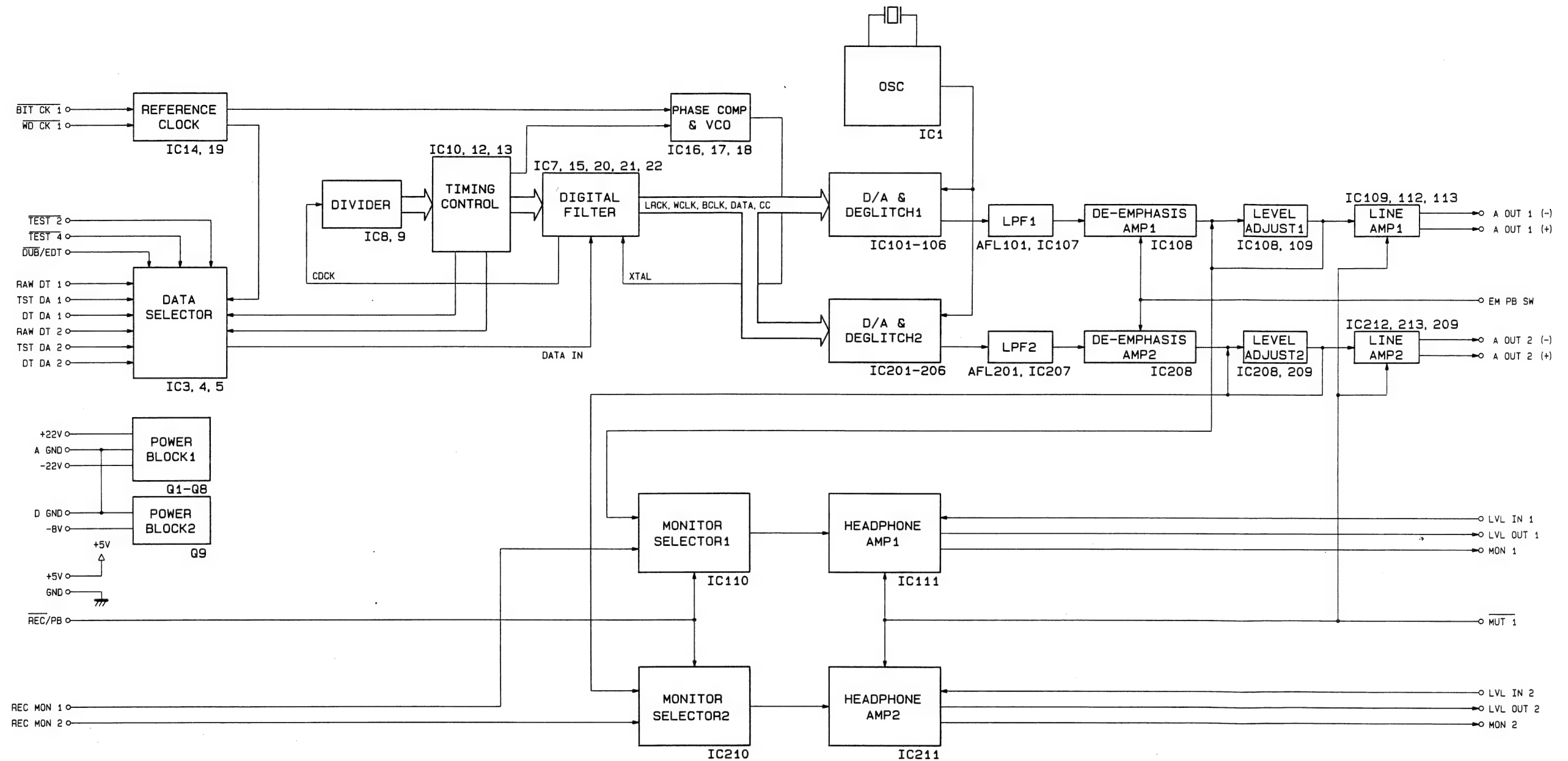
The digital section consists of reference clock, data selector, divider, timing control, phase comparator & VCO, and digital filter circuits. The clock required for the digital filter is generated by the phase comparator and VCO circuit using a PLL. The digital data of two channels are converted to a single stream of serial data by the data selector circuit, which is then fed to the digital filter circuit. The processed data and timing clock are outputted from the digital filter circuit to the DA converter in accordance with the double sampling frequency.

In the DA converter, the data received from the digital filter circuit are converted to analog signals. The DA converter (IC101 and IC201) is capable of processing the data of two channels at the same time, and therefore DA conversion can be carried out at the double sampling frequency.

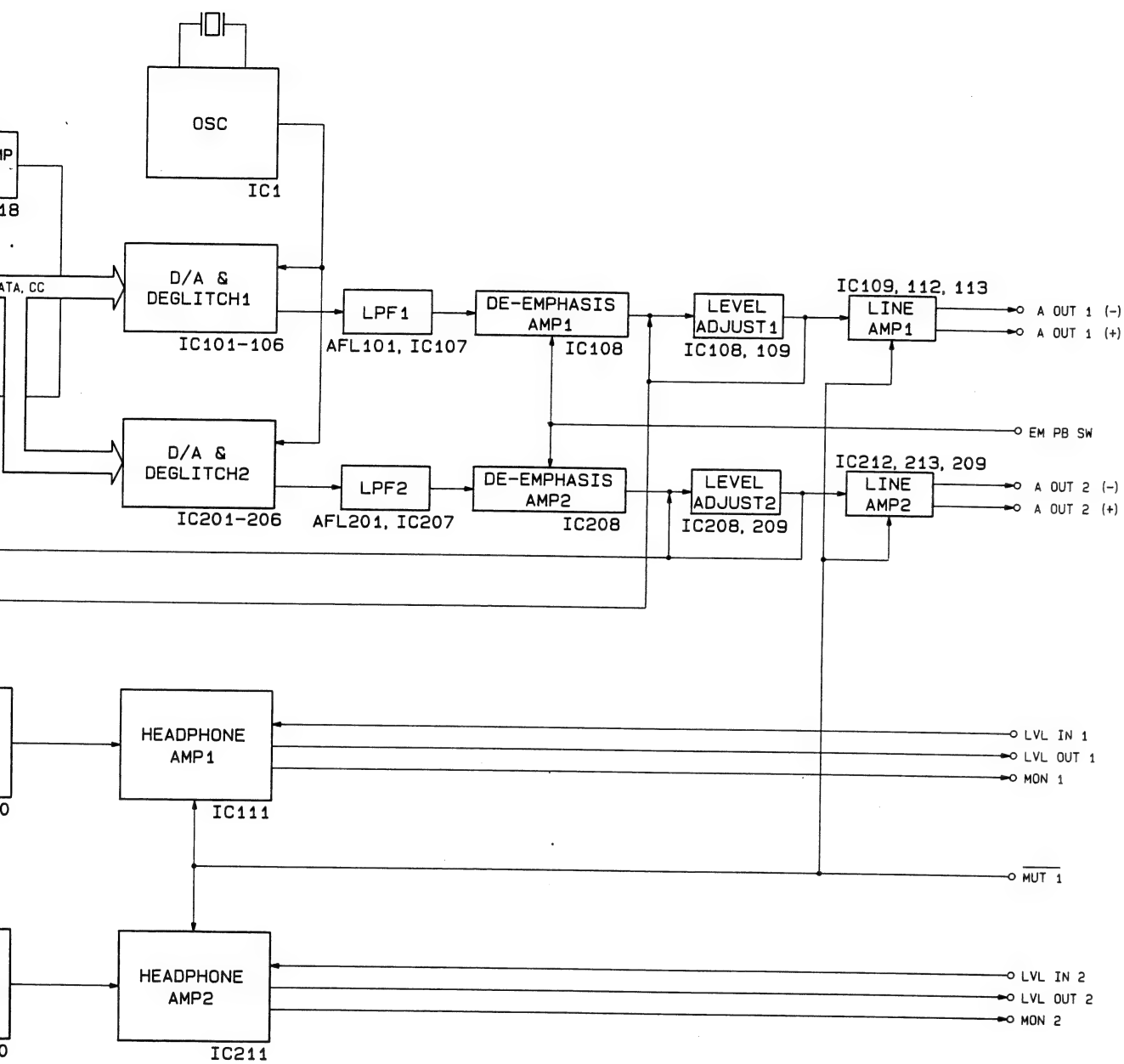
The analog section consists of LPF, de-emphasis amplifier, level adjustment, line amplifier, headphones amplifier, and monitor selector circuits. The low pass filter used in the LPF circuit is a 9 stage butterworth type which does not have ripple in the passband. The cutoff characteristics are -3 dB at 24 kHz, and -86 dB at 64 kHz. The monitor selector switches between a recording monitor signal from the AD-23 board and a playback monitor signal from this DA-15 board.



DA-15 BOARD LEVEL DIAGRAM



DA-15 BOARD BLOCK DIAGRAM



BOARD BLOCK DIAGRAM

ENC-2基板

2 CHの25スロット16ビットデジタル信号を、時分割多重化してクロスワード符号化し、35H (H; 水平TVライン) のインターリーブをかけてVIDEO信号にのせるためのデータ圧縮を行ない、EMPHASIS BIT・FS ID BITを付加してSIF-1基板へ送出することが主機能である。

SIF-1基板からの2種類の25スロット16ビットデジタル信号 (DT EN, DEC DT) をENC INセレクターSWによって選択 (ANALOG・DIGITAL時DT EN, DUBBING時DEC DT) 受信し、直/並列変換してRAM (HM6116P) に書き込む。RAMへのデータの書き込み、読み出しは、RAM CONTROL回路によって制御されるWRITE ADDRESS COUNTER及びREAD ADDRESS COUNTERからのアドレス情報をW/R ADDRESS SELECTORで選択し、RAM CONTROL回路からのENABLE信号 (OE, WE) によって行なっている。書き込みは1アドレスで各CH 4ビットずつ行ない、4アドレスで各CHの1ワードが書き込まれる。読み出しは書き込みの3倍の速度で行ない、各CH当り105ワードを単位とすることによって35Hのインターリーブがかけられ、VIDEO信号に重畳するためのデータ圧縮が行なわれる。読み出されたデータは、各CH毎に並/直列変換され、誤り訂正ビットとしてPARITYが作成 (PARITY GEN) 付加され、また誤り検出ビットとしてCRCが作成 (CRC GEN) 付加されて、35Hのインターリーブのかかったクロスワード符号となる。さらにSKEW BIT位置 (各Hの第129ビット) にコントロールビットとしてエンファシス情報 (EM ID) 及びサンプリング周波数情報 (FS ID) を付加する。EM ID及びFS IDは各インターリーブブロック (35H単位) の各々第1H及び第2HのSKEW BIT位置に付加される。これらがMUX部で時分割多重化されてDT EN VOという一本の信号となり、COMPOSITE SYNCとミキシングしてCOMPOSITE DIGITAL (VIDEO) 信号にするために、SIF-1基板へ送出される。

MUTE GEN回路は、REC MUTE SWオン時に入力データを切断して出力を無信号 (ミュート信号) にする機能の他に、ENC INセレクターSWの切換え時にノイズが出力されることを防止する機能も持っている。

また、REC EMPH SEL及びPB EMPH SELは各々録音側及び再生側のエンファシス情報の選択回路である。

その他、DI-5基板・DO-17基板 (共にオプション: DABK-1631の構成基板) の使用の有無を示すDI EN・DO EN信号もこの基板を通過する。

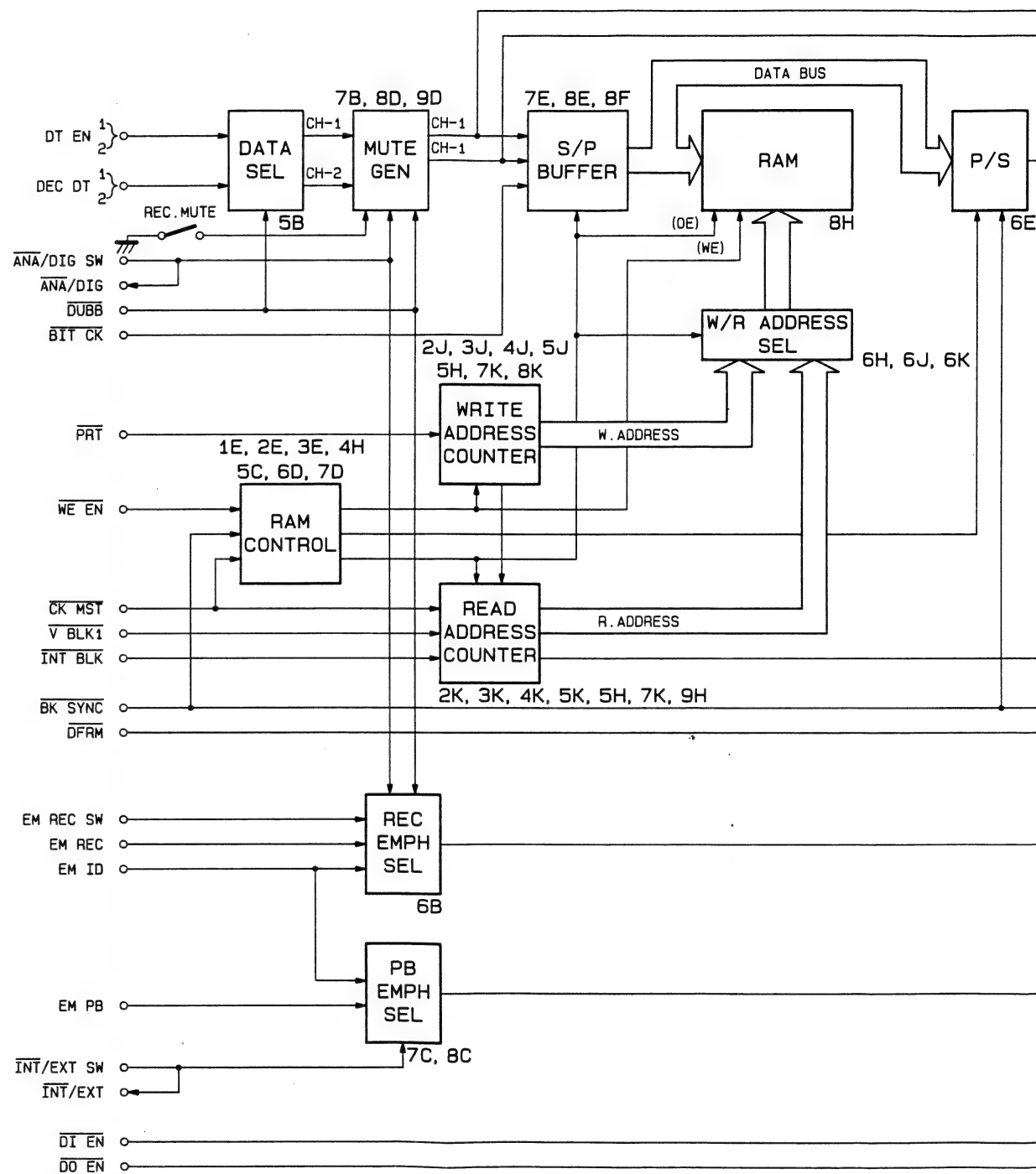
ENC-2 BOARD

On the ENC-2 board 2 channel 25 slot 16 bit digital signals are subjected to time division multiplexing and crossword coding, and are then subjected to data compression to enable them to be placed on the video signal by means of 35H interleaving (H means a horizontal TV line). EMPHASIS BIT and FS ID BIT are also added and the signals are then fed to the SIF-1 board. These are the main functions of the ENC-2 board.

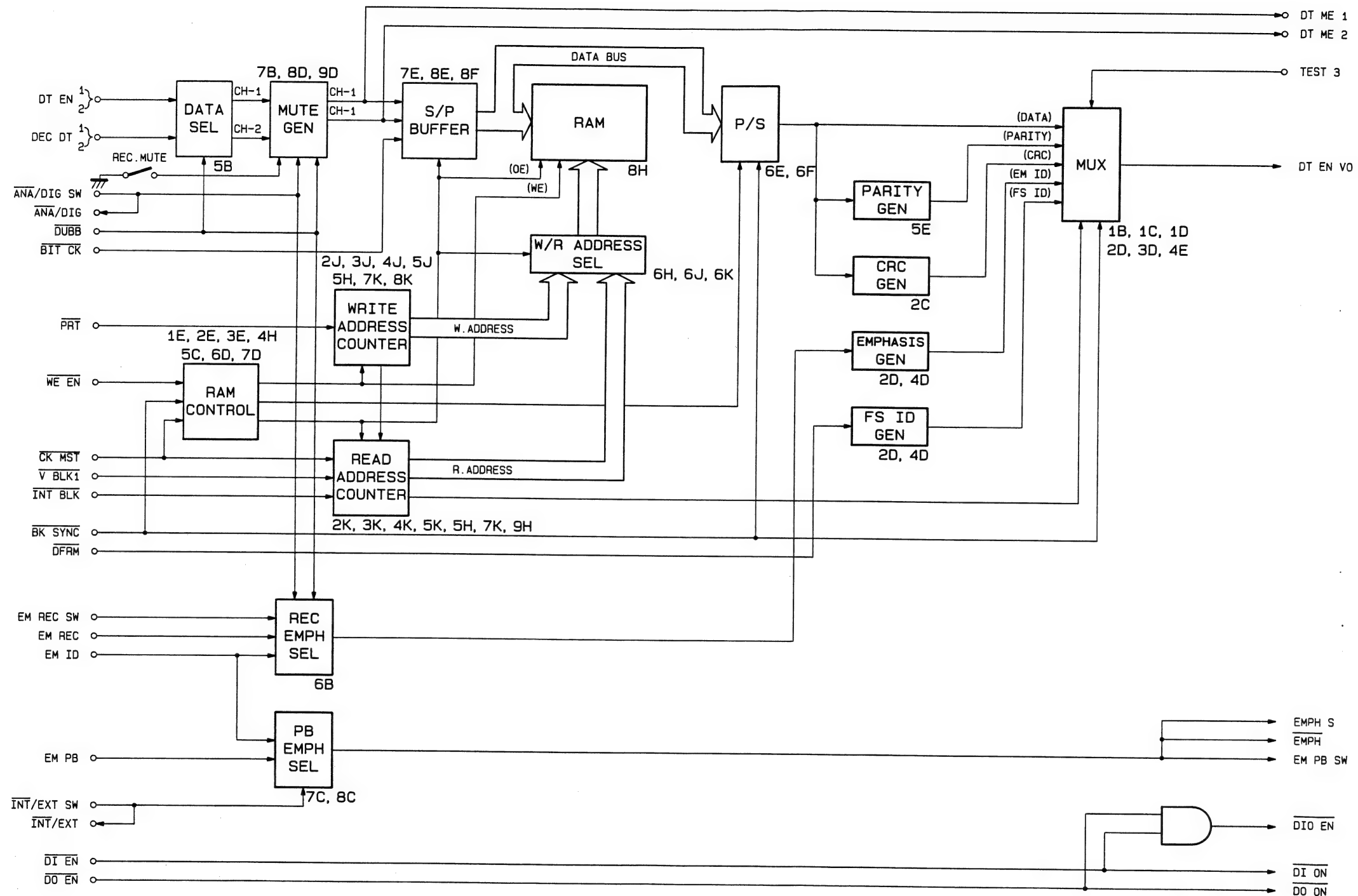
From the SIF-1 board two types of 25 slot 16 bit digital signals (DT EN and DEC DT) are selected by the ENC IN selector switch (ANALOG/DIGITAL: DT EN, DUBBING: DEC DT) and one is received. The signals are then subjected to serial/parallel conversion and written into RAM (HM6116P). Writing and reading of data to and from RAM is controlled by the RAM control circuit, and address information from the Write Address Counter and Read Address Counter is selected with the W/R Address Selector, in accordance with ENABLE signals (OE, WE) from the RAM CONTROL circuit. When writing, 4 bits for each channel are stored at a single address, so a word for each channel can be stored at four addresses. Read operations are carried out at three times the speed of write operations, and reading in units of 105 words per channel allows 35H interleaving and data compression for superposition on the VIDEO signal. Data which is read out is subjected to parallel to serial conversion alternately for each channel. Parity bits generated by a parity generator are added to the signal as error correction bits, and CRC bits generated by a CRC generator are added to the signal as error detection bits and the signal is converted to a 35H interleaved crossword code. Furthermore, at the SKEW BIT position (the 129th bit for each horizontal line), EMPHASIS information (EN ID) and sampling frequency information (FS ID) are added as control bits. The EM ID and FS ID bits are respectively added at the 1st H and 2nd H SKEW BIT positions of each interleave block (35H units). The above are subjected to time division multiplexing in the MUX section so as to form a single DT EN VO signal, which is fed to the SIF-1 board to be formed into a COMPOSITE DIGITAL (VIDEO) signal after mixing with COMPOSITE SYNC.

The MUTE GENERATOR circuit not only has a function which cuts off input data and produces a "no signal" (muting signal) output when the REC MUTE switch is ON, but also has a function which prevents output of noise when selection is made with the ENC IN selector switch. Furthermore, REC EMPH SEL and PB EMPH SEL are selection circuits for emphasis information for the record and playback sides respectively.

In addition, the DI EN and DO EN signals which indicate the use or non use of DI-5 board and DO-17 board (both options: DABK-1631), also pass through the ENC-2 board.



ENC-2 BOARD BLOCK D



ENC-2 BOARD BLOCK DIAGRAM

SIF-1 基板

PCM-1630 内のシステムインターフェイスを行なう。他に MASTER CLOCK (MCK), WORD (WD) SYNC, COMPOSITE SYNC, COMPOSITE DIGITAL, SONY FORMAT (32 ビットスロットシリアル I/O) の DIGITAL I/O 等の生成, 入出力を行なう。具体的には, 以下の 7 つの機能がある。

1. MASTER CLOCK 発振回路 (X' TAL OSC)
2. EXTERNAL SYNC 回路
3. COMPOSITE SYNC GENERATOR および ENC-2 基板用 TIMING GENERATOR
4. DIGITAL I/O 用 PLL および WD SYNC GENERATOR
5. SONY FORMAT DIGITAL I/O 回路および LINE DRIVER
6. COMPOSITE SYNC および COMPOSITE DIGITAL 出力回路
7. SYSTEM INTERFACE

以下に順を追って 1 ~ 7 項について説明する。

1. f_s の 325 倍 (14.31818 MHz または 14.3325 MHz) の MCK を発振させる。SW1 により, f_s (44.056 kHz または 44.1 kHz) の選択可能。
2. COMPOSITE SYNC > WD SYNC > AES/EBU DI SYNC という優先順位で外部同期がかけられる。それぞれの SYNC で PLL をロックさせ, 同期した MCK を生成する。また EXTERNAL SYNC の幅をカウントして f_s を 44.056 kHz か 44.1 kHz か判別する。COMPOSITE SYNC が入力した場合, 特に GEN LOCK がかかる。外部同期がロックしない場合は MUTING をかける。
3. COMPOSITE SYNC GENERATOR により H SYNC, V SYNC を生成する。
COMPOSITE SYNC で同期がかけられた場合は GEN LOCK がかかる。また ENC-2 で使われる \overline{HD} , \overline{VD} , $\overline{O/E}$, \overline{V} BLK1, INT BLK, BK SYNC を H SYNC, V SYNC から生成する。
4. f_s の 256 倍を発振させる PLL。32 ビットスロット系のマスタークロックとなる。また WD SYNC を生成する。
5. 背面パネルの DA IN から入力した DIGITAL IN DATA を CX23070 (7F, 9F) により 32 → 25 ビットスロット変換する。また DEC-15 基板からの再生 DIGITAL 信号を 25 → 32 ビットスロット変換し, DEC OUT とし出力する。

背面パネルの ENC IN から入力した DIGITAL IN DATA を CX23070 (7D, 9D) により 32 → 25 ビットスロット変換する。また AD-23 基板からの DIGITAL 信号を 25 → 32 ビットスロット変換し, AD OUT とし出力する。

6. ENC-2 基板から送られてきた符号化された DIGITAL 信号を COMPOSITE SYNC にのせて, COMPOSITE DIGITAL 信号として出力する。また 3 で作られた COMPOSITE SYNC をレベル変換して出力する。
7. 前面パネルの SW に連動して信号の流れを下記のようにコントロールする。

スイッチの位置		信号の切換え (信号名称)	
DA IN	INT	DEC-15 (DEC DT)	DA-15 (DT DA)
	EXT	DIGITAL IN (DA IN)	DA-15 (DT DA)
ENC IN	ANALOG	AD-23 (AD DT)	ENC-2 (DT EN)
	DIGITAL/ DUBBING	DIGITAL IN (ENC IN)	ENC-2 (DT EN)

SIF-1 BOARD

The SIF-1 board handles the PCM-1630's internal system interfacing as well as generation and input/output of the master clock (MCK), word (WD) sync, composite sync, composite digital signal, Sony format digital I/O (32-bit slot serial I/O) signals, etc. Stated specifically, it has the following seven functions:

1. Master clock generator circuit (X'tal oscillator)
2. External sync circuit
3. Timing generator for ENC-2 board and composite sync generator
4. PLL for digital I/O and word sync generator
5. Sony format digital I/O circuit and line driver
6. Composite sync and composite digital output circuits
7. System interface

Each of these seven functions will be explained in detail below.

1. Master Clock Generator Circuit

Oscillates a master clock of 325 times the sampling frequency (14.31818 MHz or 14.3325 MHz). Sampling frequency of either 44.056 kHz or 44.1 kHz can be selected with SW1.

2. External Sync Circuit

External synchronization is applied in the following order of precedence.

Composite sync > Word sync > AES/EBU DI sync

The PLL is locked to the respective sync signals and a synchronized master clock (MCK) is generated. Also the width of the external sync is counted, and a judgement made of whether the sampling frequency is 44.056 kHz or 44.1 kHz. When composite sync has been input, the GEN LOCK is engaged. When locking to external sync does not occur, unlock signal to mute data is generated.

3. Timing Generator for ENC-2 Board and Composite Sync Generator

Both H and V sync signals are generated by composite sync generator. When synchronized with the composite sync, GEN LOCK will be engaged.

The HD, VD, O/E, V BLK1, INT BLK, and BK SYNC signals used at the ENC-2 board are also generated from the H and V sync signals.

4. PLL for Digital I/O and Word Sync Generator

The PLL generates a frequency of 256 times the sampling frequency, to be used as the master clock for the 32-bit slot data. The word sync signal is also generated.

5. Sony Format Digital I/O Circuit and Line Driver

The digital data from the DA IN connector on the rear panel are converted from a 32-bit to 25-bit slot data by CX23070 (7F and 9F). The playback digital data from the DEC-15 board are also converted from a 25-bit to 32-bit slot data and outputted from the DEC OUT connector.

Similarly, the digital data from the ENC IN connector on the rear panel are converted from a 32-bit to 25-bit slot data, but this time, by CX23070 (7D and 9D). The data from the AD-23 board are converted from a 25-bit to 32-bit slot data and outputted from the AD OUT connector.

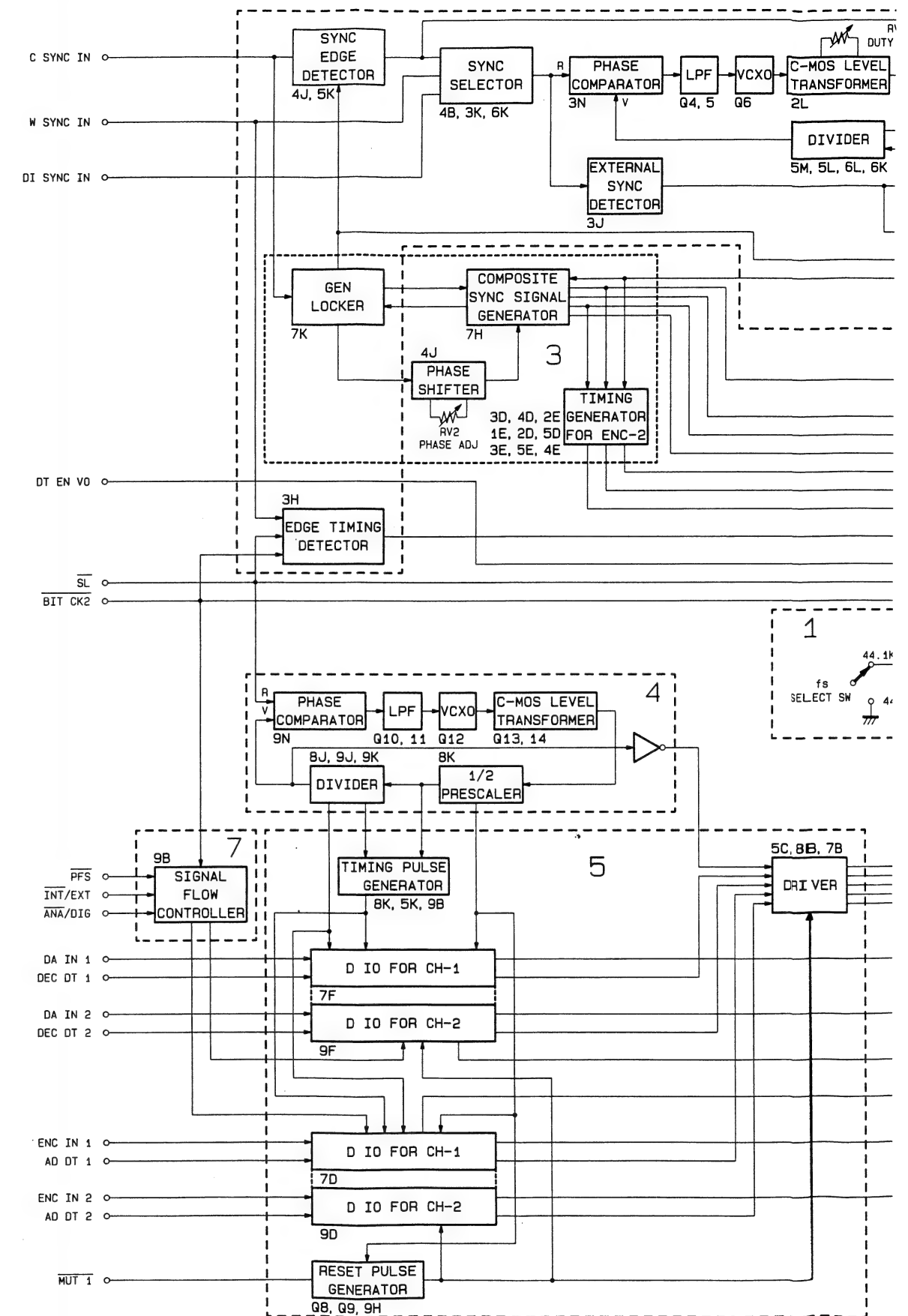
6. Composite Sync and Composite Digital Output Circuits

The composite sync signal is added to the encoded digital signal from the ENC-2 board, to be outputted as the composite digital signal. It also converts the level of the composite sync signal generated by the composite sync generator described in the above "3" and outputs it.

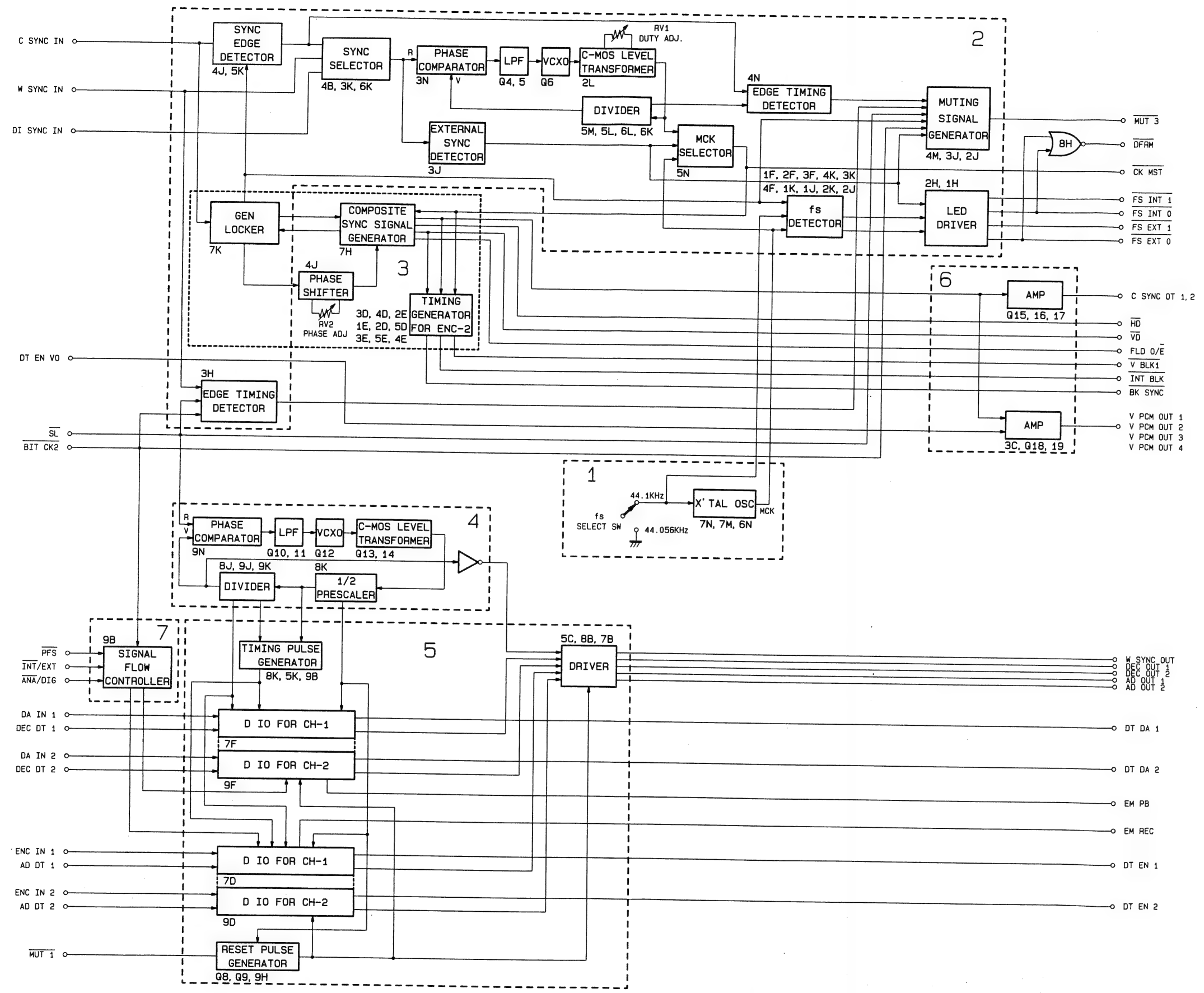
7. System Interface

The signal flow can be changed as follows, using the DA IN and ENC IN selectors on the front panel.

Selector Position		Signal Flow (Signal Name)	
DA IN	INT	DEC-15 (DEC DT)	DA-15 (DT DA)
	EXT	DIGITAL IN (DA IN)	DA-15 (DT DA)
ENC IN	ANALOG	AD-23 (AD DT)	ENC-2 (DT EN)
	DIGITAL/ DUBBING	DIGITAL IN (ENC IN)	ENC-2 (DT EN)



SIF-1 BOARD BLC



SIF-1 BOARD BLOCK DIAGRAM

DEC-15

デジタルオーディオレコーダーからの COMPOSITE DIGITAL (VIDEO) 信号を受信して、SYNC 及び DATA 分離を行ない、エラーチェックして再生復号データを出力する機能をもっている。

デジタルオーディオレコーダーからの2つの COMPOSITE DIGITAL 信号 (V PCM IN A 及び B) は、PB MODE セレクター及び RAR-1 基板 (オプション) 上の RAW スイッチの状態を監視している PB MODE DECODER からの制御信号により一方が選択受信 (A または RAR: IN A, B: IN B) され、クランプがかけられた後コンパレーターで同期信号とデータに分離される (VIDEO CLAMPER および COMPARATOR)。コンパレーターに必要な比較電圧は、AUTO THRESHOLD CONTROL 回路によって発生され、入力信号レベルに応じて自動的に制御される。

分離された同期信号とデータは SYNC SEP LSI (CX23074) に入力され、ここで再生系に必要なクロックが作成される。またデータは遅延回路を経由して DATA SEP LSI (CX23073A) に入力される。ここでは入力されたデータに対して、CRC エラーチェックおよび同期化を行なってデータ及びエンフェシス情報・サンプリング周波数情報を抽出するとともに、エラー信号・ミュート信号を発生する。さらにエラー状態にもとづいて、データが最適抽出できるように遅延回路を制御する。DATA SEP からのデータは次に DEC-A LSI (CX23071) に入力される。ここでは、インターリーブがかけられて圧縮されている入力データを、デインターリーブしてサンプリング間隔に伸長し、CH-1・CH-2 ごとに時間配列の正しい信号として出力 (LSB ファースト) すると共に、入力データのエラー状態にもとづいてシンδροーム S21, S22, S23 を発生する。また各基板に必要な 25 スロット系のビットクロック (BIT CK) ・ワードクロック (WDCK) 等も発生する。

DEC-A からの信号を受信する DEC-B LSI (CX23072) では、シンδροームにもとづいてエラー訂正・補正を行ない、また DATA SEP 等からのミュート信号によりデータにミュートをかけて、復号データとして出力する。また復号データの状態を示す訂正 (C: CORRECTION), 平均値補間 (A: AVERAGE), 前値補間 (H: HOLD), ミュート (M: MUTE) の各信号及びパリティエラー (P: PARITY) 信号も出力する。

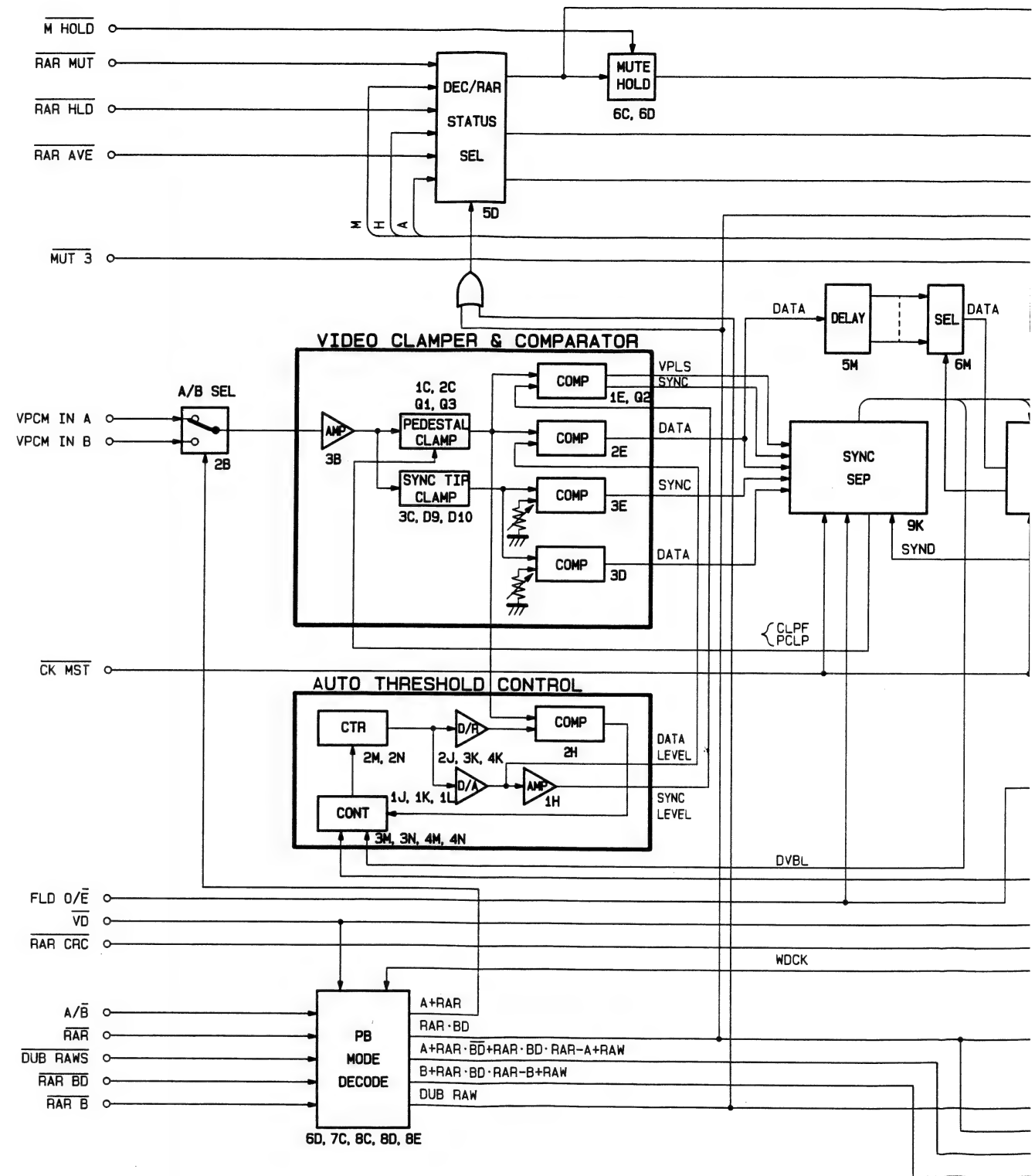
また、RAR-1 基板 (オプション) がある場合には、PB MODE DECODER によってステータス情報 (MUTE, HOLD, AVERAGE 等) の出力を選択制御 (RAR または RAW モード: RAR 信号を選択) する (DEC/RAR STATUS SELECTOR)。

DEC-15 BOARD

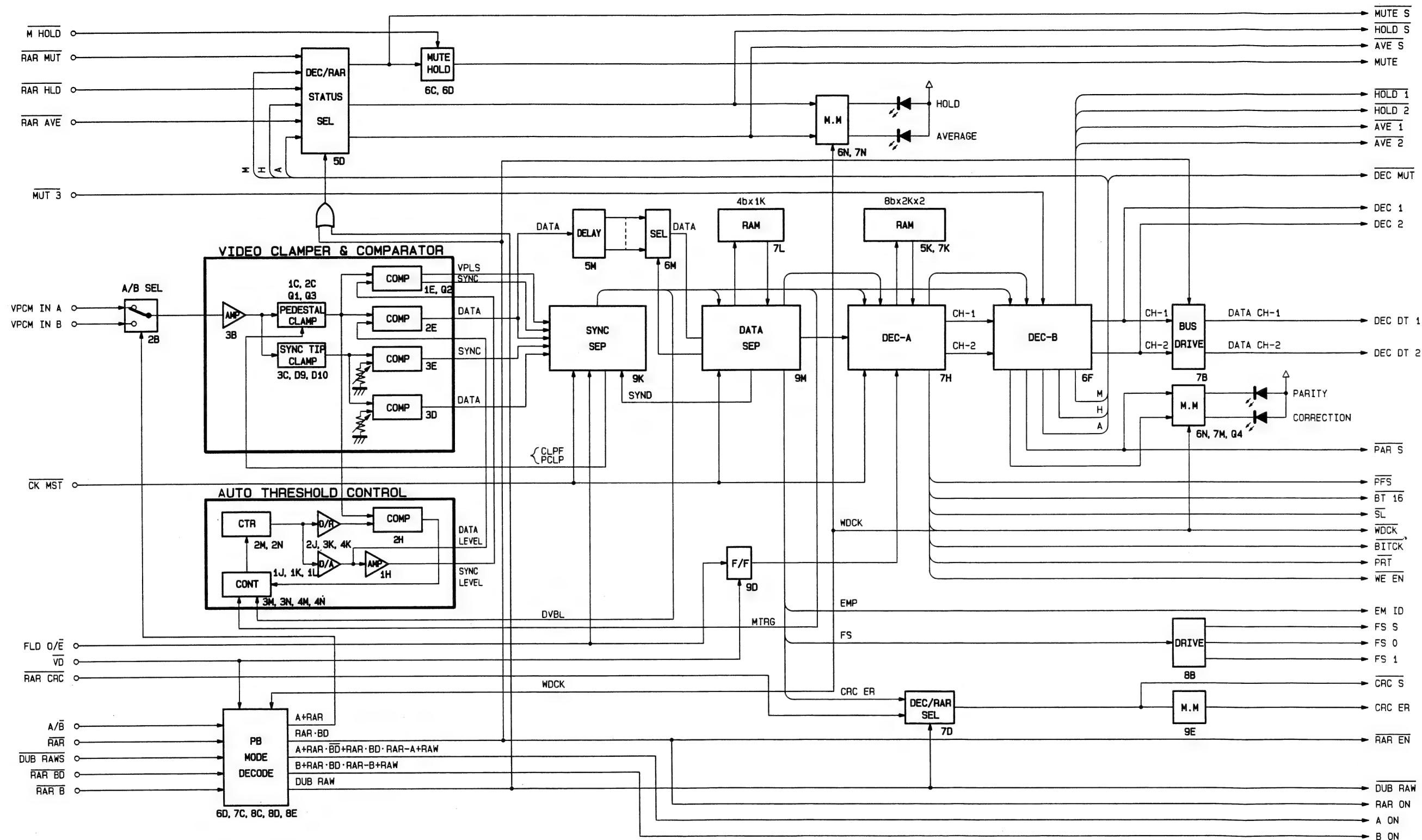
Receiving the composite digital (video) signal from the digital audio recorder, the DEC-15 circuit separates the sync signal from the digital data, performs an error check, and feeds out decoded playback data.

One of the two composite digital signals (V PCM IN A and B) from the digital audio recorder is selected (A or RAR: IN A, B: IN B) by the control signal from the PB mode decoder, which monitors the condition of the RAW switch on the RAR-1 board (optional) and the PB mode selector. It is then clamped, and sent to the comparator for separating the sync signal from the digital data (video clamper and comparator). The comparison voltage required by the comparator is generated by the auto threshold control circuit and controlled automatically in accordance with the input signal levels. The separated data and sync signal are sent to the SYNC SEP LSI (CX23074) where the clocks necessary for playback are generated. The data then go into the DATA SEP LSI (CX23073A) via the delay circuit. In this LSI, they are first subjected to CRC error checks and synchronization, followed by extraction of the audio data as well as emphasis and sampling frequency information. Error and muting signals are thus produced as the result of this operation. Based on the error condition, the DATA SEP LSI also controls the delay circuit to ensure optimum data extraction. The data from the DATA SEP LSI is next fed to the DEC-A LSI (CX23071). Here the data which has been subjected to interleaving and compression is deinterleaved and expanded to the sampling interval and outputted in CH-1 and CH-2, with LSB first, in the correct time sequence. At the same time, syndromes S21, S22 and S23 are generated according to the input data error status. The 25-bit slot bit clock (BITCK) and word clock (WDCK), etc., required by other boards are also generated. In the DEC-B LSI (CX23072) that receives signals from the DEC-A LSI, error correction and compensation are carried out in accordance with the syndromes. Muting is also applied to the data in accordance with the muting signal from DATA SEP etc. and the decoded data is outputted. The DEC-B LSI also feeds out the signals such as correction (C: CORRECTION), mean-value interpolation (A: AVERAGE), previous value holding (H: HOLD) and muting (M: MUTE) that indicate the state of the decoded data, and a parity error signal (P: PARITY).

In addition, when the optional RAR-1 board is used, it is possible to select and control the output of status information (MUTE, HOLD, AVERAGE etc.) by the PB mode decoder (RAR or RAW mode; RAR signal).



DEC-15 BOARD BLC



DEC-15 BOARD BLOCK DIAGRAM

MT-16

入力デジタルデータのレベルに対応したレベルメーター表示をするための制御回路であり、動作は、CPU (μ PD8749HD) に内蔵されているプログラムの手順に従って行なわれる。

3種類の入力データ (DT DA, DT ME, RAW DT) は DATA SELECTOR で選択される。この DATA SELECTOR は モニター切換えスイッチ (REC/PB) と RAR-1 基板 (オプション) の RAW SW (DUB/OFF/EDT) によって制御され、DUB モード ($\overline{\text{DUB/EDT}}=0$) では RAW DT が、それ以外では REC モード ($\overline{\text{REC/PB}}=0$) で DT ME が、PB モード ($\overline{\text{REC/PB}}=1$) では DT DA が各々選択される。

選択されたデータは CONTROL CLOCK GENERATOR によって制御される処理過程を経て CPU (μ PD8749HD) に取り込まれる。まず S/P 変換回路で両 CH とも 16 ビットパラレル信号に変換され、絶対値回路 (ABSOLUTE VALUE CONVERTER) で 2 の補数から絶対値に変換される。次に COMPARATOR でこの後にある LATCH 回路の出力データ (COMPARISON DATA) と比較され、入力データレベルがこの比較データレベルと等しいか大きいならば、LATCH 回路に取り込まれる。この後は約 11 MHz のクロックで動作する CPU の制御に委ねられ、BUS BUFFER を経て 8 ビットずつ CPU に取り込まれる。いったんデータが取り込まれると RESET PULSE 回路からリセット信号が出され、LATCH 回路をクリアして COMPARISON DATA をゼロにする。CPU へのデータの取り込みは 3 msec 周期であるので LATCH 回路をクリアする (即ち CPU にデータを取り込む) 前に、LATCH 回路のデータより大きなレベルの入力データが来ると、LATCH 回路はその入力データに置き換えられる。CPU は外部スイッチ情報 (SCALE, PEAK, HR1~6) を SW ENCODER から、また内部スイッチ情報を MODE SELECT から取り込み、それらに基づいてデータ処理を行なう。CPU に制御されるメーターの LED は各 CH とも 32 個あるが、これらを 16 個ずつの 4 セグメントに分けてダイナミック点灯する (6 msec 周期) ために、CPU からの処理データは SEGMENT DRIVER により各セグメントの LED のアノードを制御する MA1~4、I/O EXPANDER PORT を経て DIGIT DRIVER により各セグメント内の 16 個の LED のカソードを制御する MD0~15 として出力される。

また、OVER LEVEL DETECTOR はフルスケールレベルのデータが何ワード連続して入力してきたかの検出回路であり、この検出出力があると OVER 表示を行なう。

なお、25 スロット系のワードクロック・ビットクロック及びデータは、RS-422 DRIVER よりリモート信号 (R WDCK, R BIT CK, R DT1, R DT2) として STATUS コネクターに送られる。

MT-16 BOARD

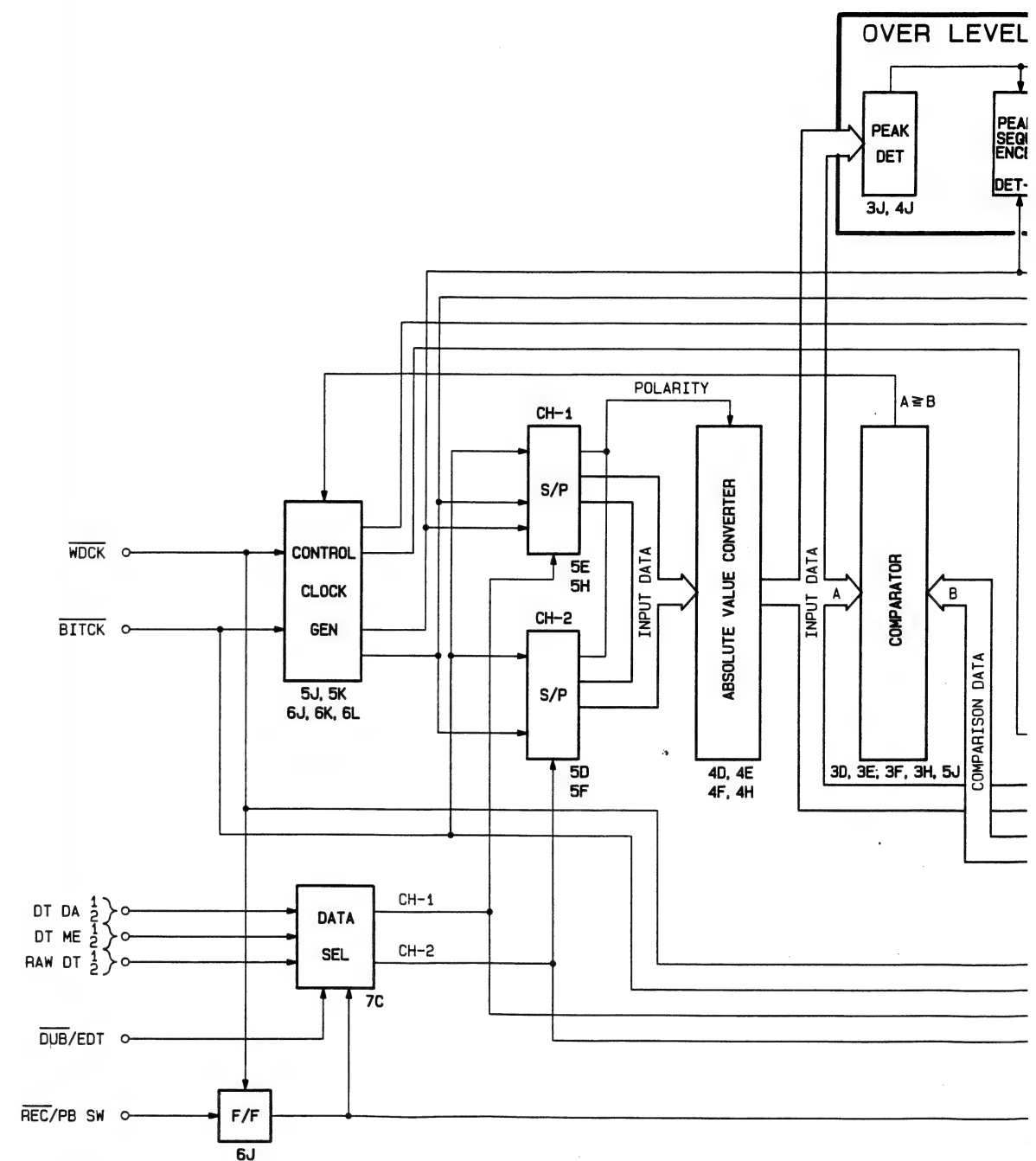
The MT-16 board is a control circuit to enable level meter indication corresponding to the level of input digital data.

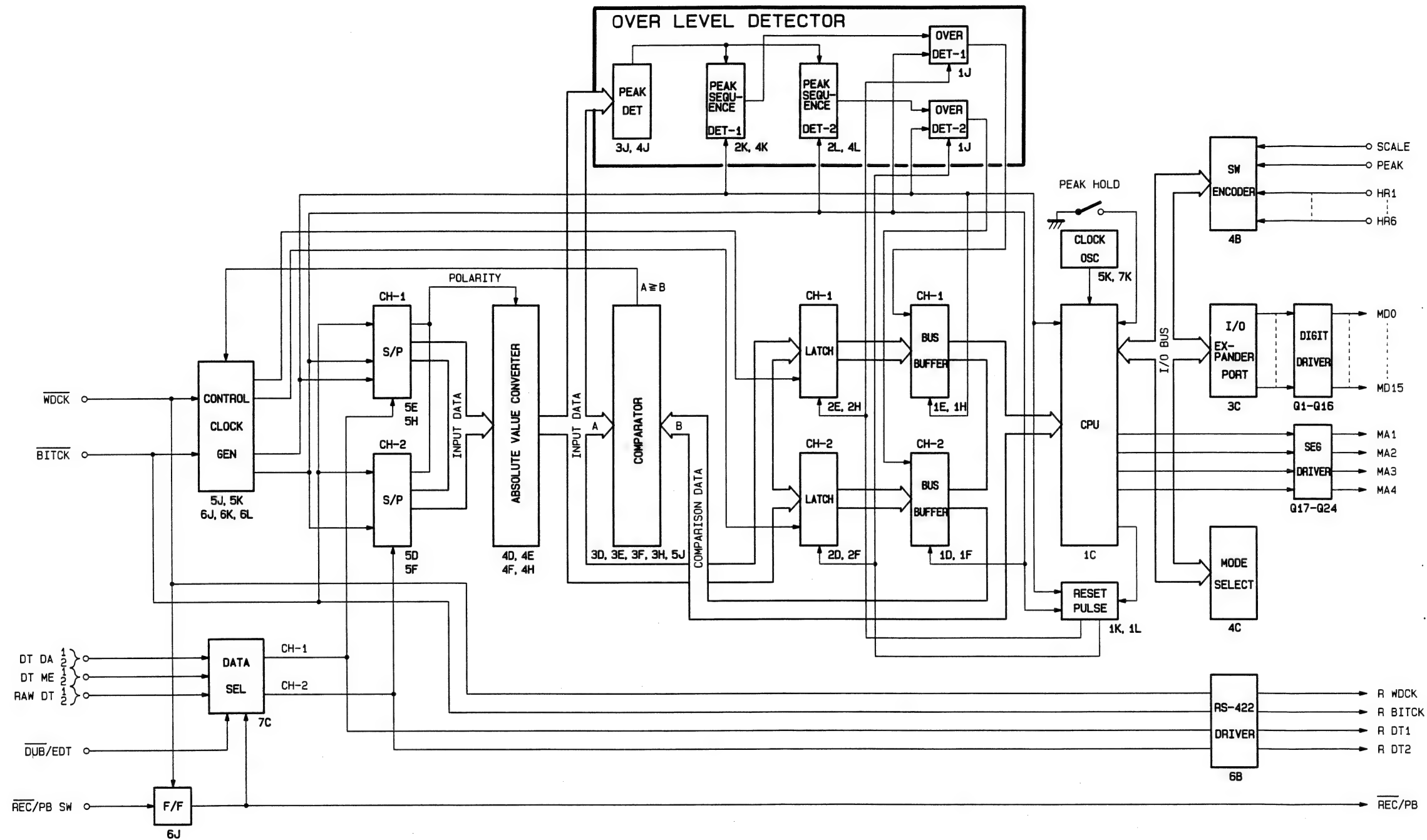
Operation of this circuit is based on a program contained in a CPU (μ PD8749HD).

Three types of input data (DT DA, DT ME, and RAW DT) are selected by the data selector. The data selector is controlled by the monitor select switch (REC/PB) and the RAW switch (DUB/OFF/EDT) on the optional RAR-1 board. In DUB mode ($\overline{\text{DUB/EDT}}=0$), RAW DT is selected. In other cases, DT ME is selected in REC mode ($\overline{\text{REC/PB}}=0$), and DT DA in PB mode ($\overline{\text{REC/PB}}=1$), respectively.

The selected data undergo the processing procedure, which is controlled by the control clock generator, and then go into the CPU (μ PD8749HD). In more detail, both channels of data are first converted into 16-bit parallel signals in the serial/parallel (S/P) conversion circuit, and are converted from 2's complement to absolute values by the absolute value converter. Next, at the comparator, these data are compared with the output data (comparison data) from the following latch circuit, and if the level of input data is equal to or higher than the level of the comparison data, they are latched into the latch circuit. After then, these data are placed under the control of the CPU operating with a clock of about 11 MHz, and these are read into the CPU via bus buffers, with 8 bits at a time. Once data has been read in, a reset signal is outputted from the reset pulse circuit, clearing the latch circuit and resetting the COMPARISON DATA to zero. Since data is read into the CPU with a 3 msec. cycle, if input data having a greater level than the level of the output data from the latch circuit arrive before the latch circuit has been cleared (i.e. before the output data from the latch circuit have been read into the CPU), the data from the latch circuit will be replaced by the input data. External switch information (SCALE, PEAK, HR1-6) and internal switch information are read into the CPU from the switch encoder and the mode selector respectively. The CPU processes data based on the information obtained from these sources. The meter which the CPU controls has 32 LEDs for each channel. These are divided into 4 segments, each consisting of 16 LEDs. In order to make them light up dynamically at 6 msec. intervals, processed data from the CPU are outputted from the segment driver as MA1-4 (designed to control the anodes for the 4 segments) and also outputted from the digit driver, after passing through the I/O expander port, as MD0-15 for controlling the cathodes of the 16 LEDs within each segment.

There is also an over level detector circuit which counts how many full-scale data have been input in succession. The OVER display is activated by the output from this detector circuit. Furthermore, the 25-slot word clock, bit clock and data are sent by the RS-422 driver as remote signals (R WDCK, R BITCK, R DT1 and R DT2), to the STATUS connector.



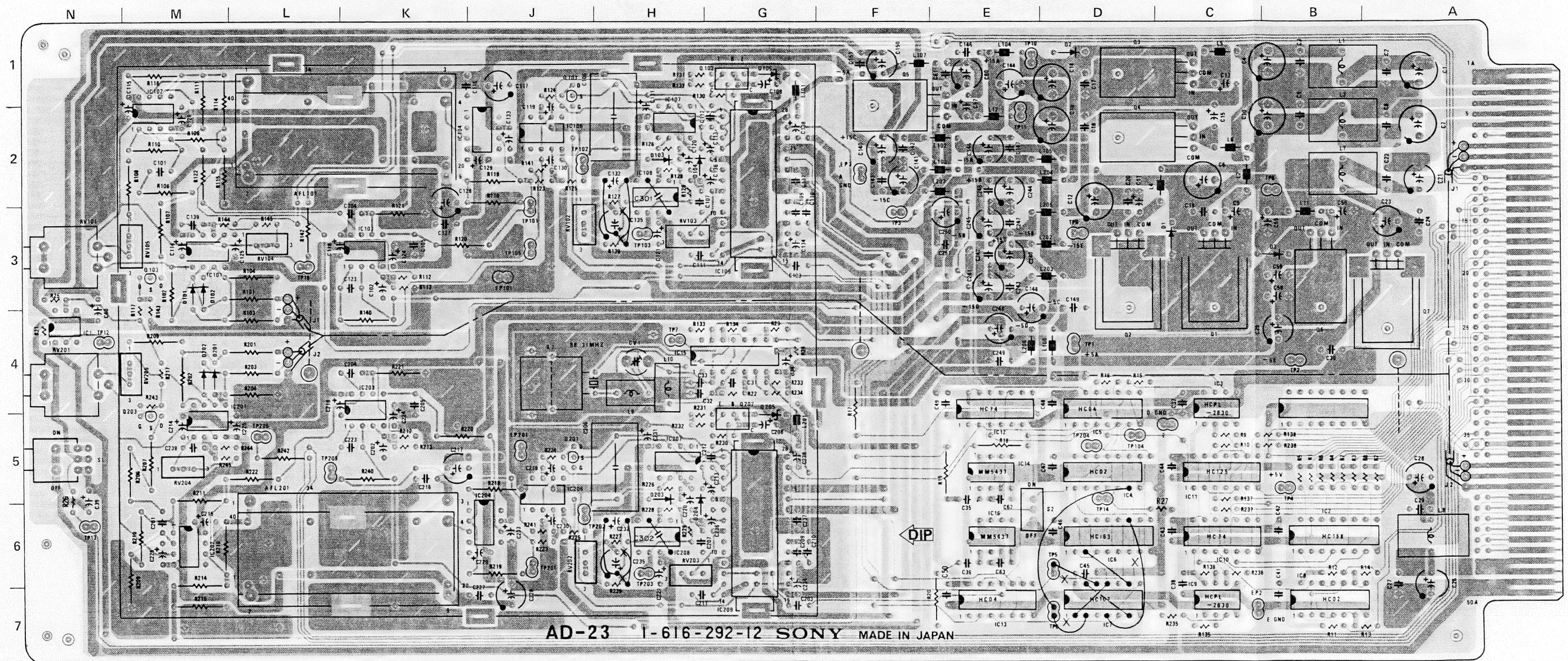


MT-16 BOARD BLOCK DIAGRAM

SECTION C

SCHEMATIC AND CIRCUIT BOARD DIAGRAMS

AD-23 BOARD (1-616-292-12) S/N: 10001 TO 10800
Component Side



■ SOLDER SIDE PATTERN 1-616-292-12
■ COMPONENT SIDE PATTERN 1-616-292-12

Note: TP16 on the AD-23 board has been misprinted.
Please read TP16 as TP106.

Traces that have been cut.

C132----C135
C135----R139
TP5----IC7-9
TP6----IC7-5
C232----C235
C235----R239
IC4-6----IC7-5

Jumpers that have been soldered.

C132----C135
C132----R139
C232----C235
C232----R239
IC4-6----TP6
IC7-2----TP6
IC7-4----IC6-11
IC7-1----IC7-11
IC7-6----IC7-13
IC7-12----TP5
IC7-9----IC6-2

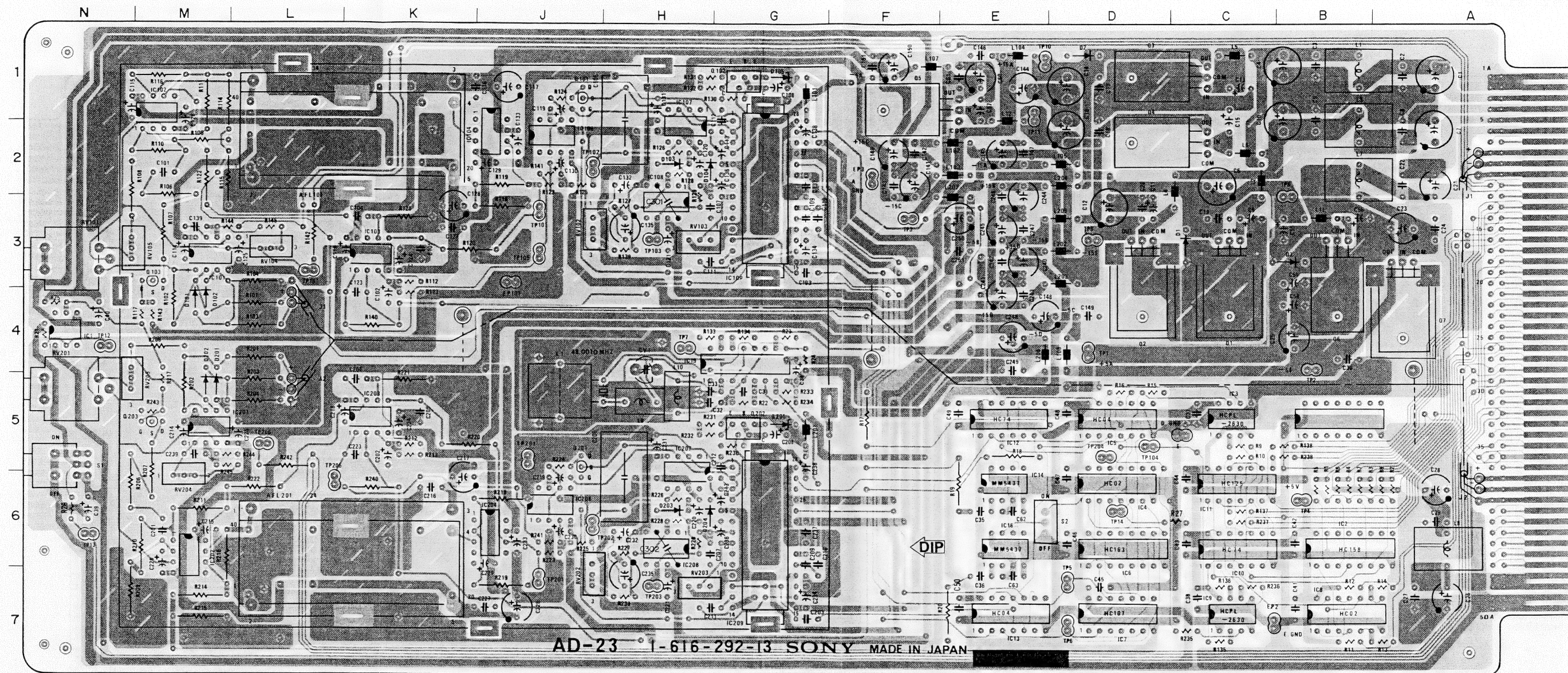
Parts that have been added.

C301
C302
*C135
*C235

* Only C135 and C235 have been reversely installed against the polarity printed on the board.

AD-23 BOARD (1-616-292-13)
Component Side

S/N; 10801 AND HIGHER



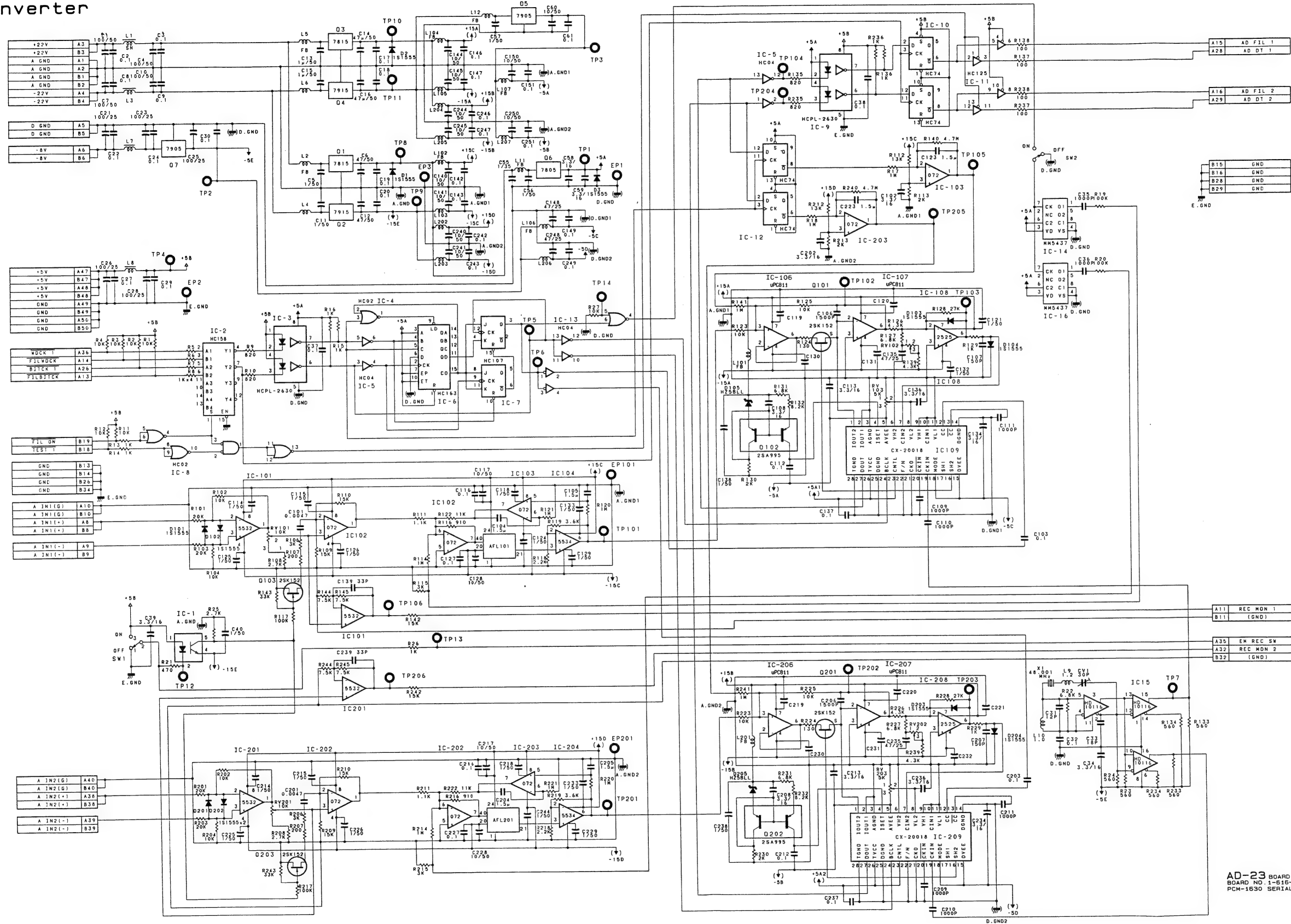
■ SOLDER SIDE PATTERN 1-616-292-13
■ COMPONENT SIDE PATTERN 1-616-292-13

Note: TP16 on the AD-23 board has been misprinted.
Please read TP16 as TP106.

Parts that have been added.

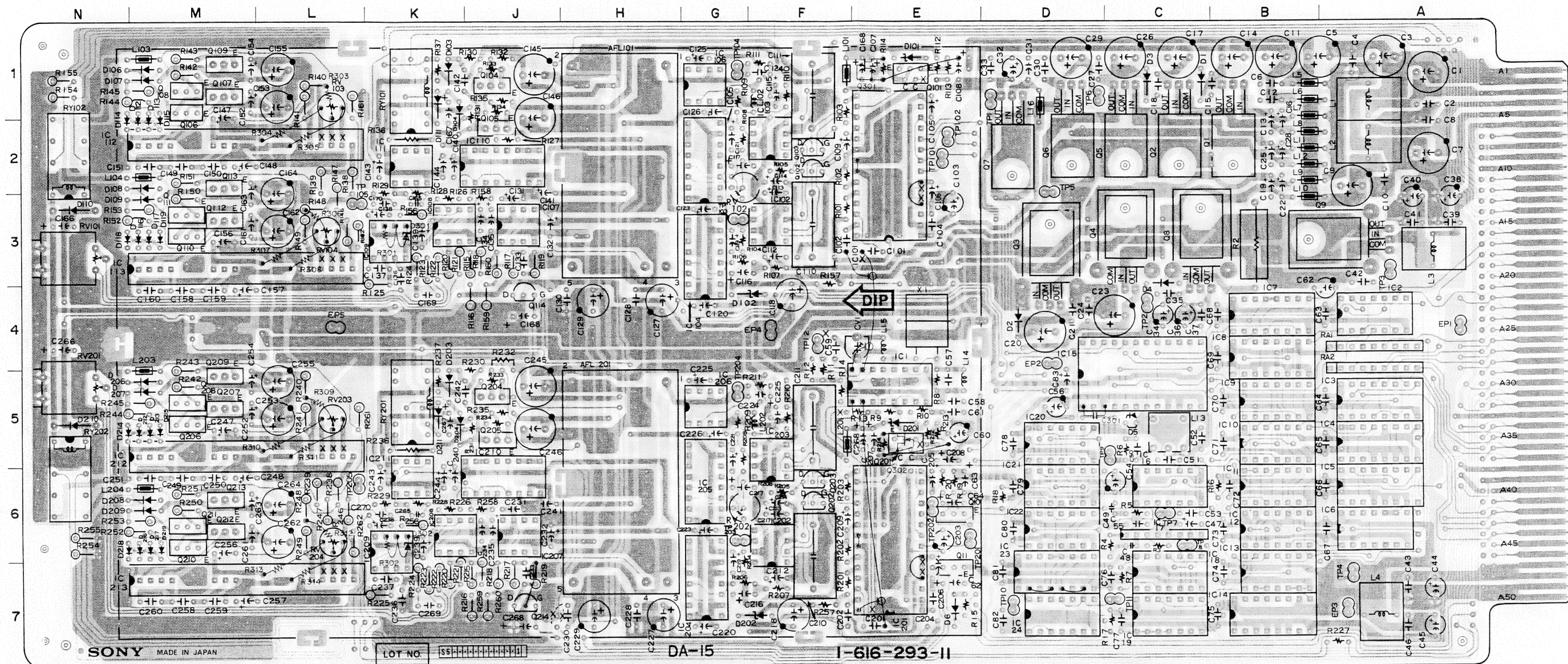
C301
C302

AD-23 BOARD
Rec Audio
A/D Converter



DA-15 BOARD (1-616-293-11)
Component Side

S/N: J, U/C 10001 TO 10204
S/N: AEP 10001 TO 10126



■ SOLDER SIDE PATTERN 1-616-293-11
■ COMPONENT SIDE PATTERN 1-616-293-11

Traces that have been cut.

RV103 ---- IC112-18	Q101-C ---- C108
RV103 ---- IC112-19	IC105-4 ---- IC105-5
RV103 ---- IC112-20	IC105-5 ---- IC105-6
RV104 ---- IC113-18	TP12 ---- Thru hold near X1
RV104 ---- IC113-19	IC1-3 ---- C201
RV104 ---- IC113-20	C101 ---- Thru hold near R157
RV203 ---- IC212-18	Q201-C ---- Thru hold near Q201
RV203 ---- IC212-19	C201 ---- Thru hold near IC1
RV203 ---- IC212-20	IC201-4 ---- IC201-5
RV204 ---- IC213-18	IC201-5 ---- IC201-6
RV204 ---- IC213-19	GND ---- Thru hold near Q214
RV204 ---- IC213-20	

C-7 (a)

Jumper that have been soldered.

Q214-S ---- R219
R114 ---- C108
IC105-21 ---- IC105-22
IC105-4 ---- IC105-6
R214 ---- C208
IC201-21 ---- IC201-22
IC201-4 ---- IC201-6
C201 ---- IC1-2
IC23-2 ---- IC23-4
IC23-5 ---- IC23-7
C101 ---- IC1-15

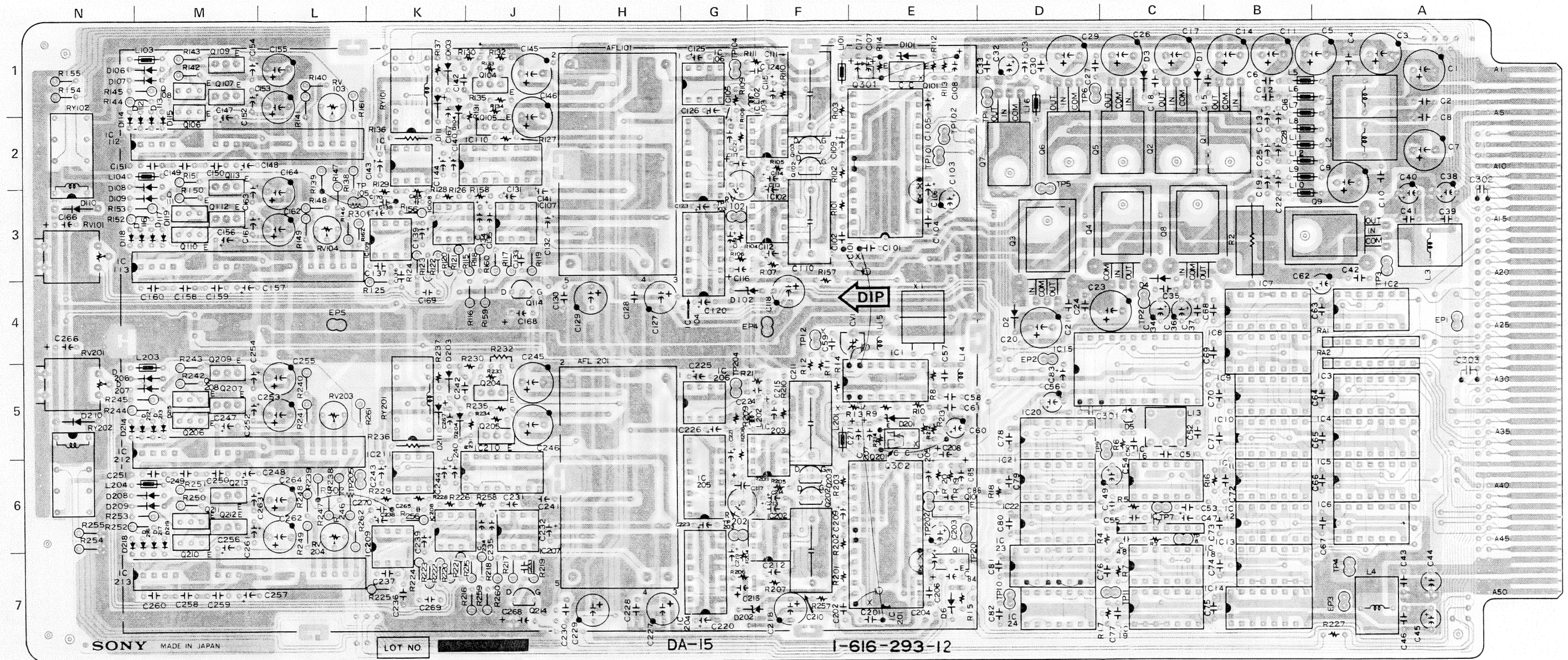
Parts that have been added.

D301, D302 ---- HZ5BLL
R301, R302 ---- 1M
R303, R306, R309, R312 ---- 430K
R304, R305, R307, R308
R310, R311, R313, R314 ---- 22K
C301
Q301, Q302

C-8 (a)

DA-15 BOARD (1-616-293-12)
Component Side

S/N: J, U/C 10205 TO 10800
S/N: AEP 10127 TO 10800



■ SOLDER SIDE PATTERN 1-616-293-12
■ COMPONENT SIDE PATTERN 1-616-293-12

Traces that have been cut.

Q101-C ---- C108
IC105-4 ---- IC105-5
IC105-5 ---- IC105-6
TP12 ---- Thru hold near X1
IC1-3 ---- C201
IC101 ---- Thru hold near R157
Q201-C ---- Thru hold near Q201
C201 ---- Thru hold near IC1
IC201-4 ---- IC201-5
IC201-5 ---- IC201-6

Jumper that have been soldered.

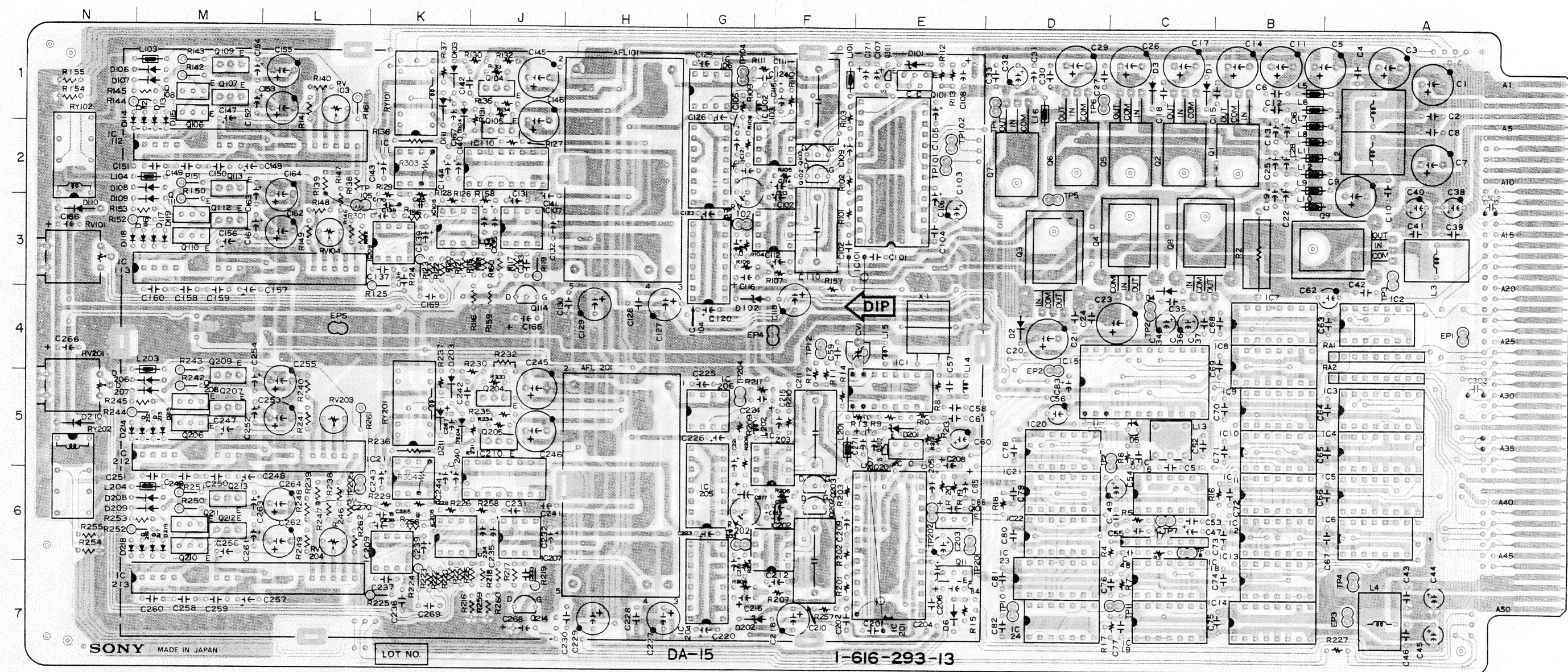
R114 ---- C108
IC105-21 ---- IC105-22
IC105-4 ---- IC105-6
R214 ---- C208
IC201-21 ---- IC201-22
IC201-4 ---- IC201-6
C201 ---- IC1-2
IC23-2 ---- IC23-4
IC23-5 ---- IC23-7
C101 ---- IC1-15

Parts that have been added.

R301
R302
C301
C302
C303
Q301
Q302

DA-15 BOARD (1-616-293-13)
Component Side

S/N: 10801 AND HIGHER

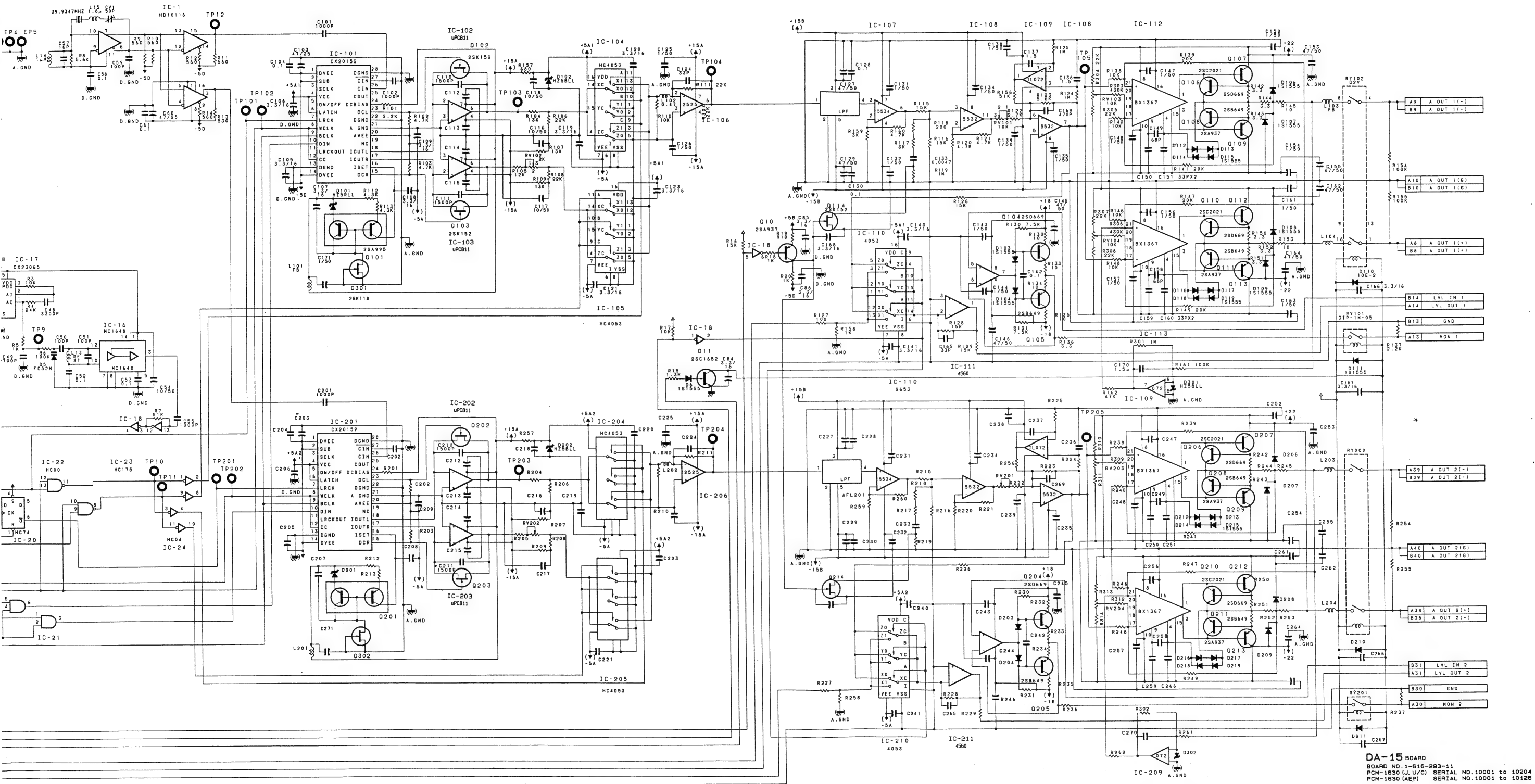


■ SOLDER SIDE PATTERN 1-616-293-13
■ COMPONENT SIDE PATTERN 1-616-293-13

Applicable Serial NO.	Jumpers that have been soldered.	Parts that have been added.
10801 and higher	C201---- IC1-2 C101---- IC1-15	R301 R302 R303 R304 C301 C302 C303
11301 and higher	A34 ---- A35	—

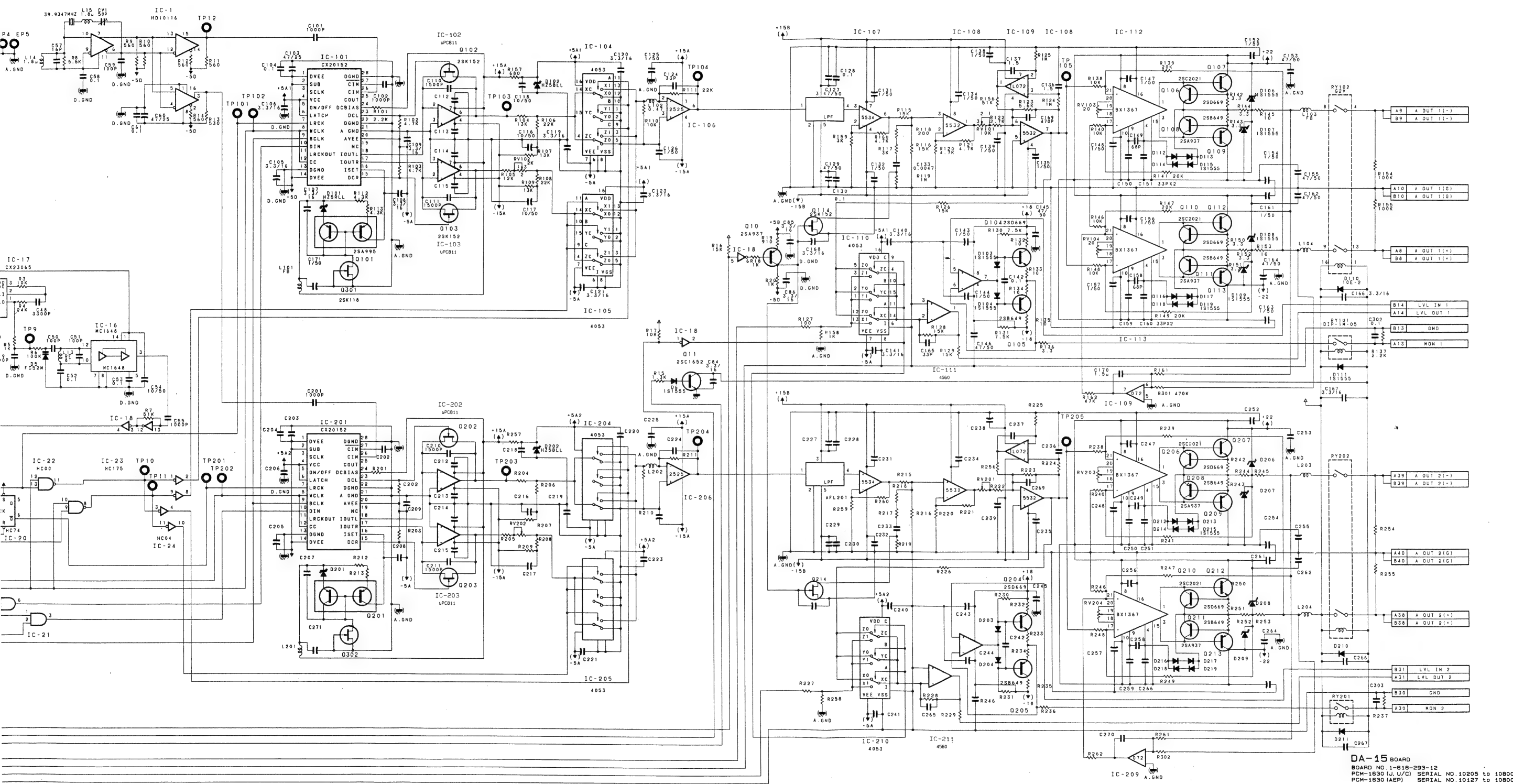
C-7 (c)

C-8 (c)



C-10 (a)

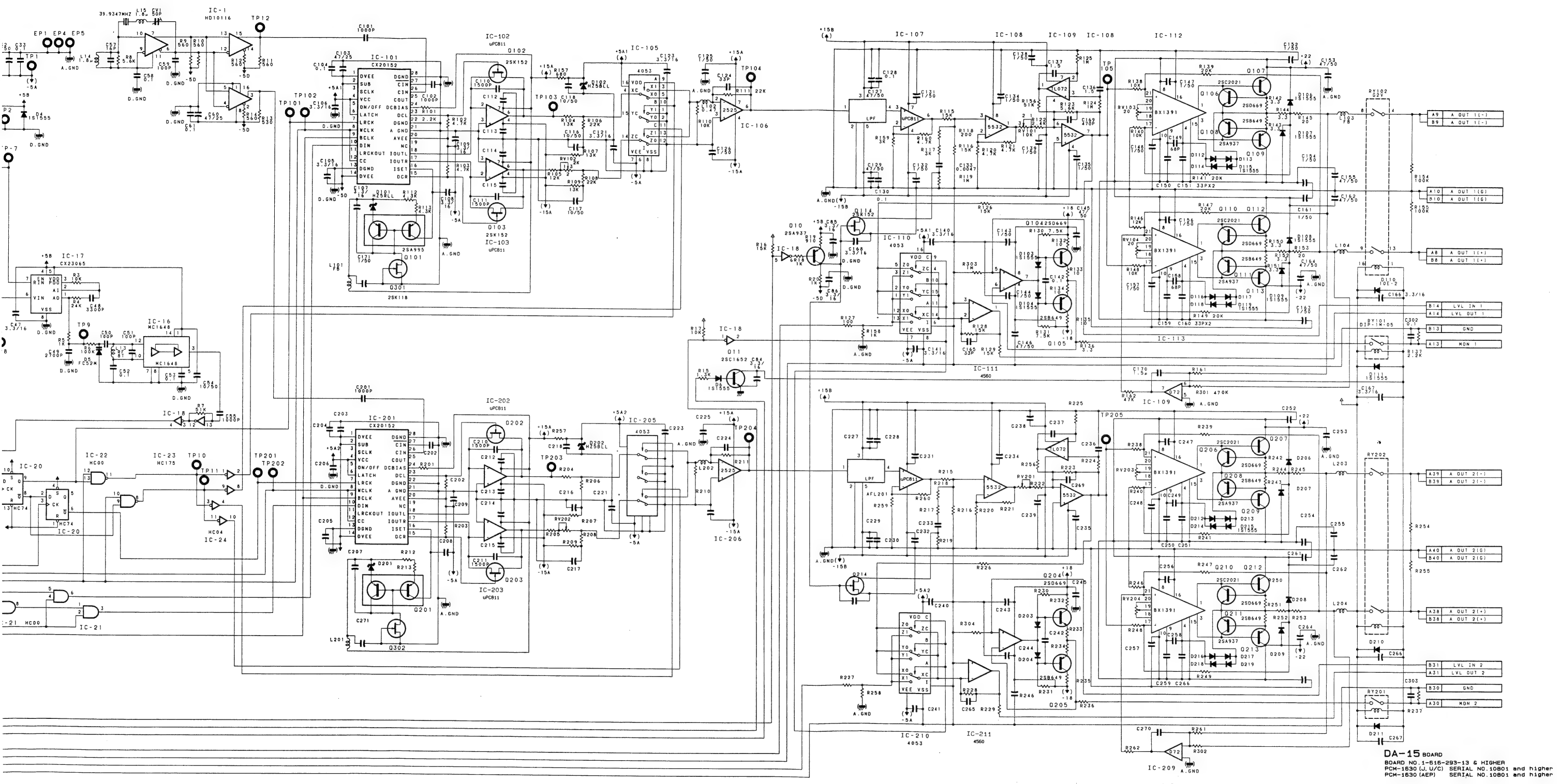
C-11 (a)



* THE CIRCUIT DIAGRAM OF CH2 IS THE SAME AS CH1

C-10 (b)

C-11 (b)



DA-15 BOARD
BOARD NO. 1-616-293-13 & HIGHER
PCM-1630 (J, U/C) SERIAL NO. 10801 and higher
PCM-1630 (AEP) SERIAL NO. 10801 and higher

* THE CIRCUIT DIAGRAM OF CH2 IS THE SAME AS CH1

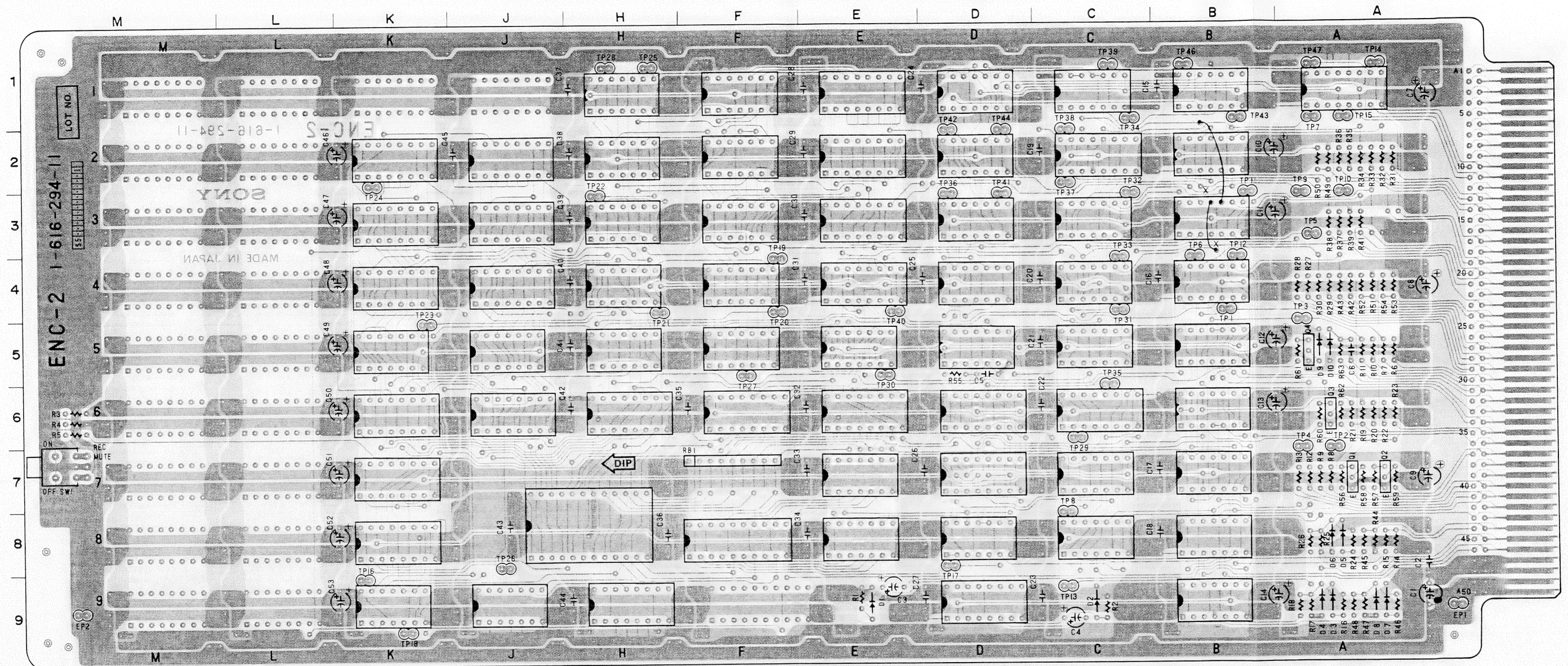
higher.

C-10 (c)

C-11 (c)

ENC-2 BOARD (1-616-294-11)
Component Side

S/N; J, U/C	10001	TO	10204
S/N; AEP	10001	TO	10126



■ SOLDER SIDE PATTERN

1-616-294-11

Traces that have been cut.

IC1C-3 ---- IC3B-11
IC3B-10 ---- IC4C-9

Jumpers that have been soldered.

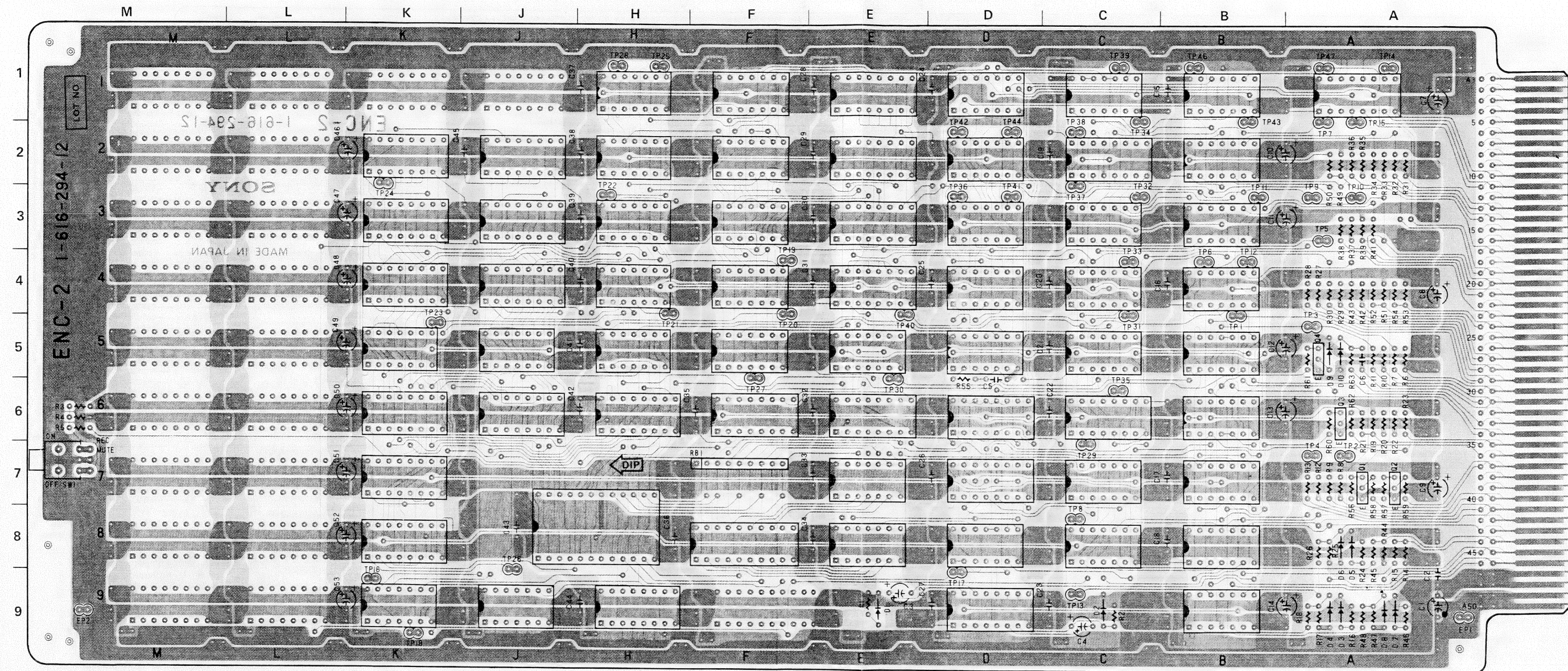
IC1C-3 ----IC3B-10
IC3B-11 ----IC4C-9

C-13 (a)

C-14 (a)

ENC-2 BOARD (1-616-294-12)
Component Side

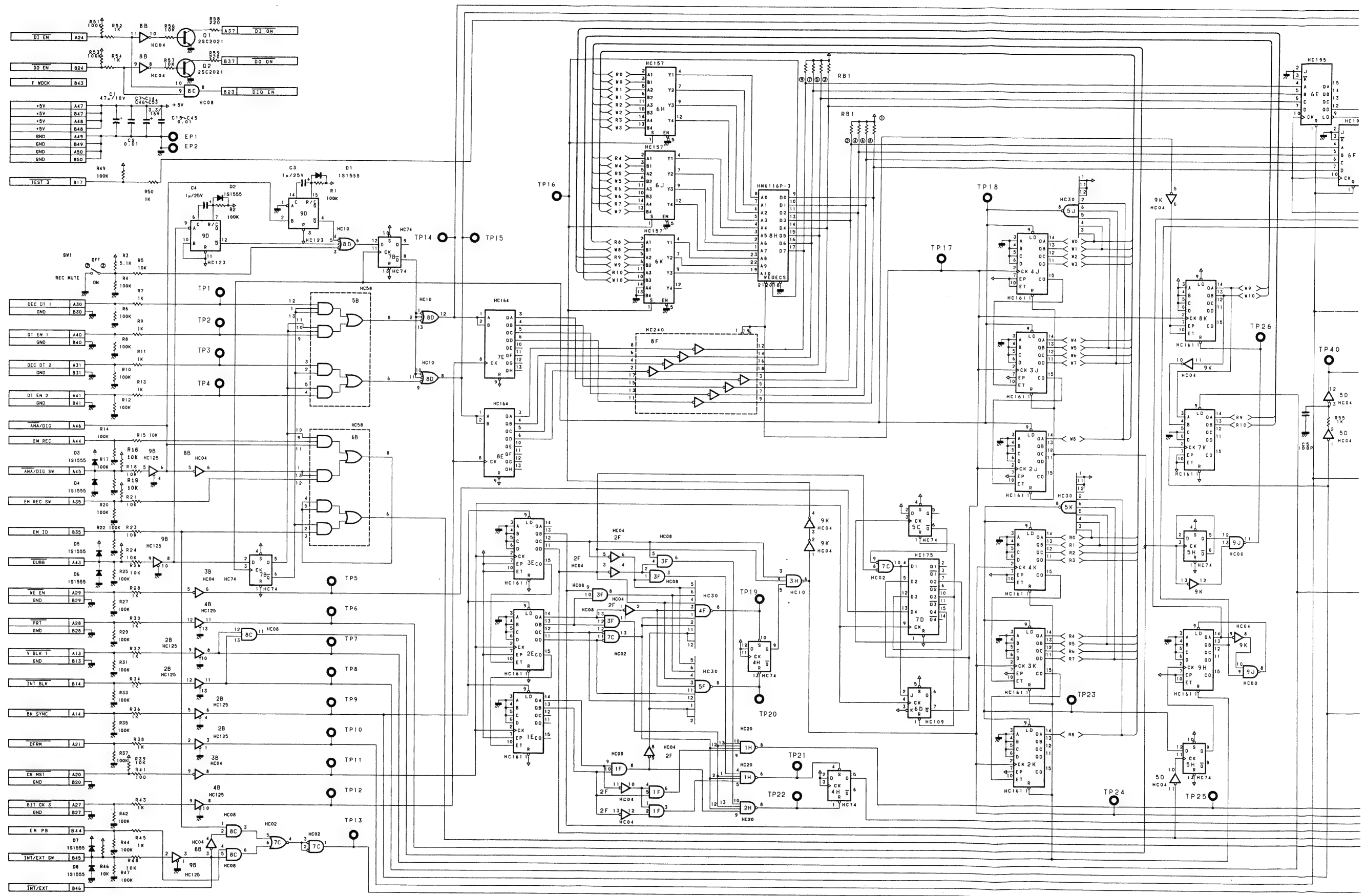
S/N: J, U/C 10205 AND HIGHER
S/N: AEP 10127 AND HIGHER

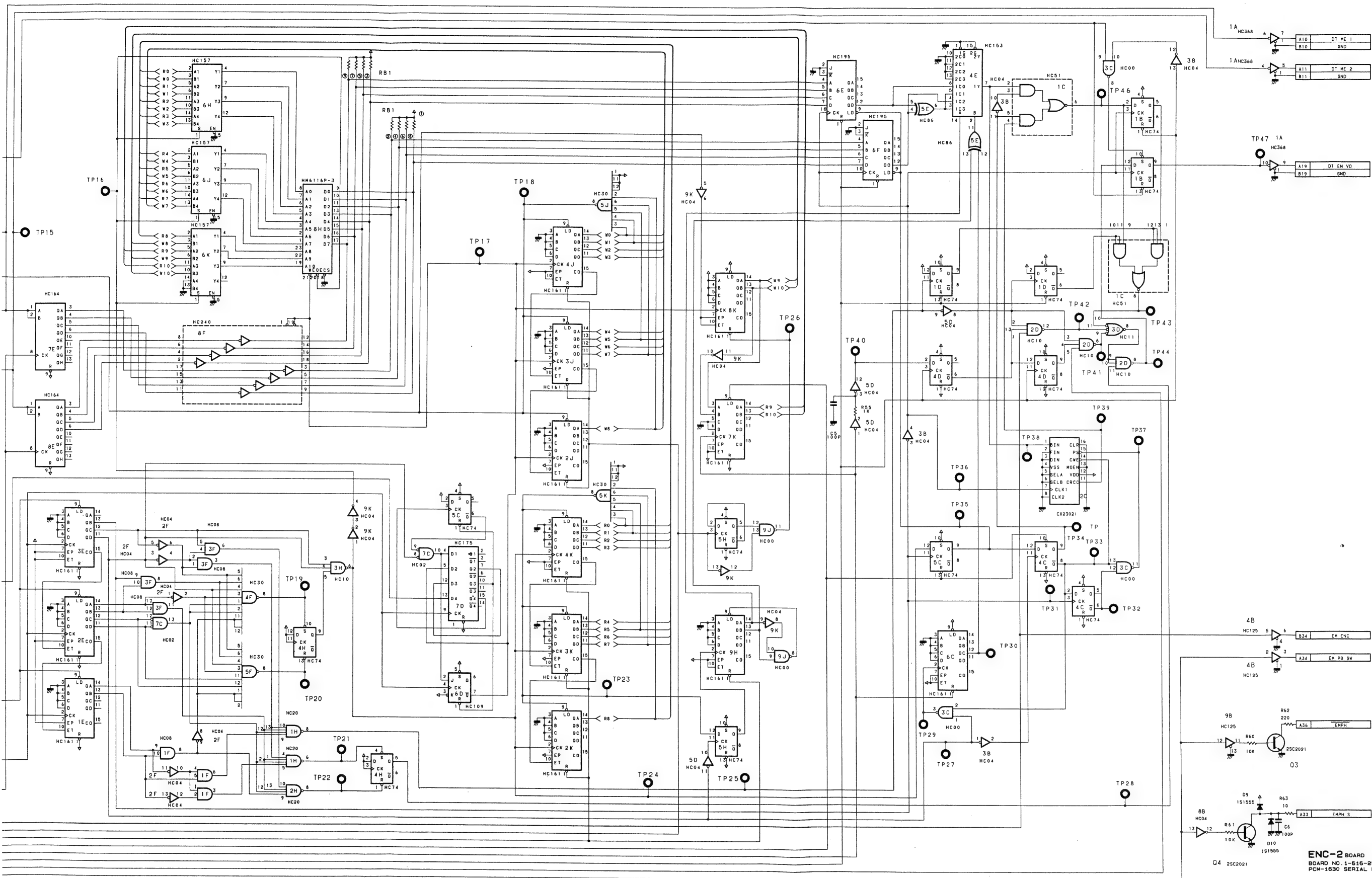


■ SOLDER SIDE PATTERN 1-616-294-12
■ COMPONENT SIDE PATTERN 1-616-294-12

ENC-2 BOARD
Encoder

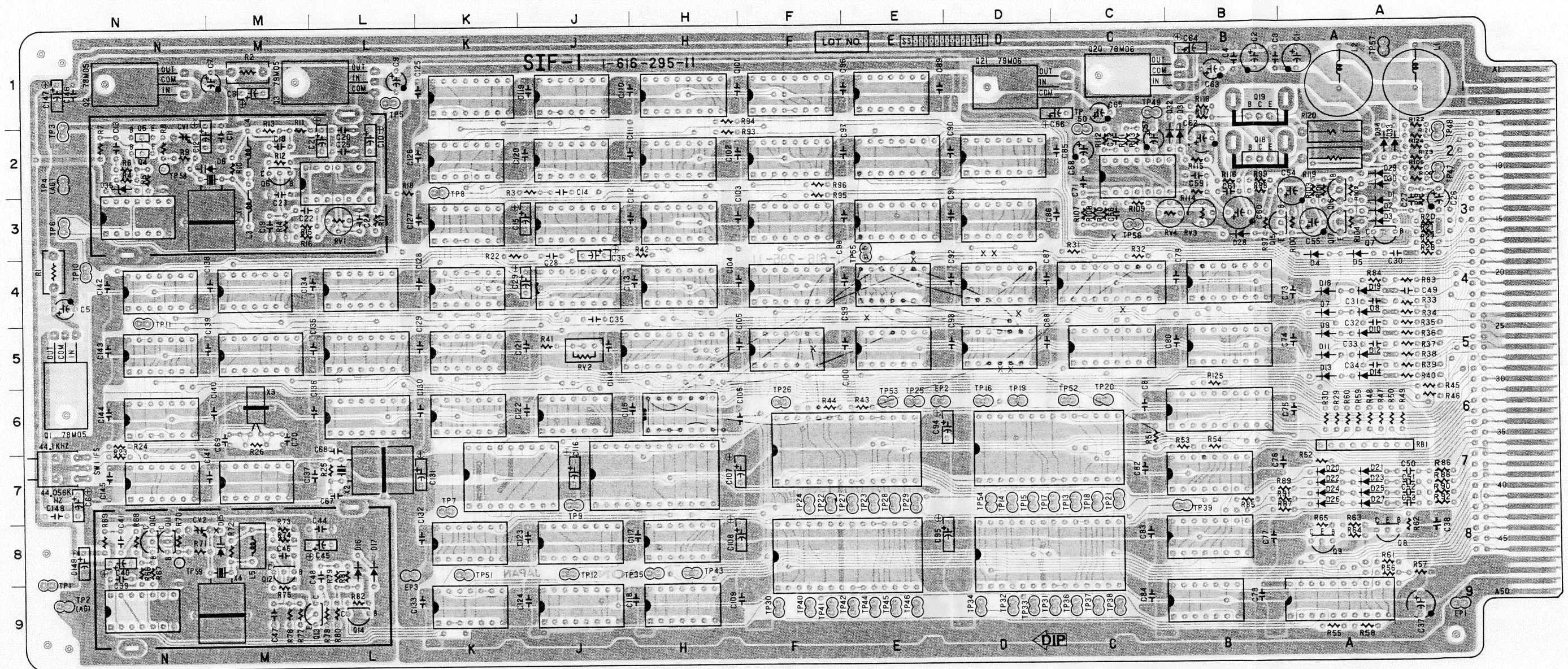
ENC-2 ENC-2





SIF-1 BOARD (1-616-295-11)
Component Side

S/N: J, U/C 10001 TO 10204
S/N: AEP 10001 TO 10126



■ SOLDER SIDE PATTERN 1-616-295-11
■ COMPONENT SIDE PATTERN 1-616-295-11

Traces that have been cut.

IC4E-2----GND
IC4E-3----GND
IC4E-4----GND
IC4C-7----TP56
IC4C-15----IC5D-9
IC4C-15----IC4E-9
IC3D-12----IC4D-2
IC2D-1----IC4D-3
IC5F-7----IC5F-9
TP55----Thru hold near IC5E
IC4D-8----IC5D-12
IC5D-4----IC5D-5
IC5D-5----IC5D-7

Jumpers that have been soldered.

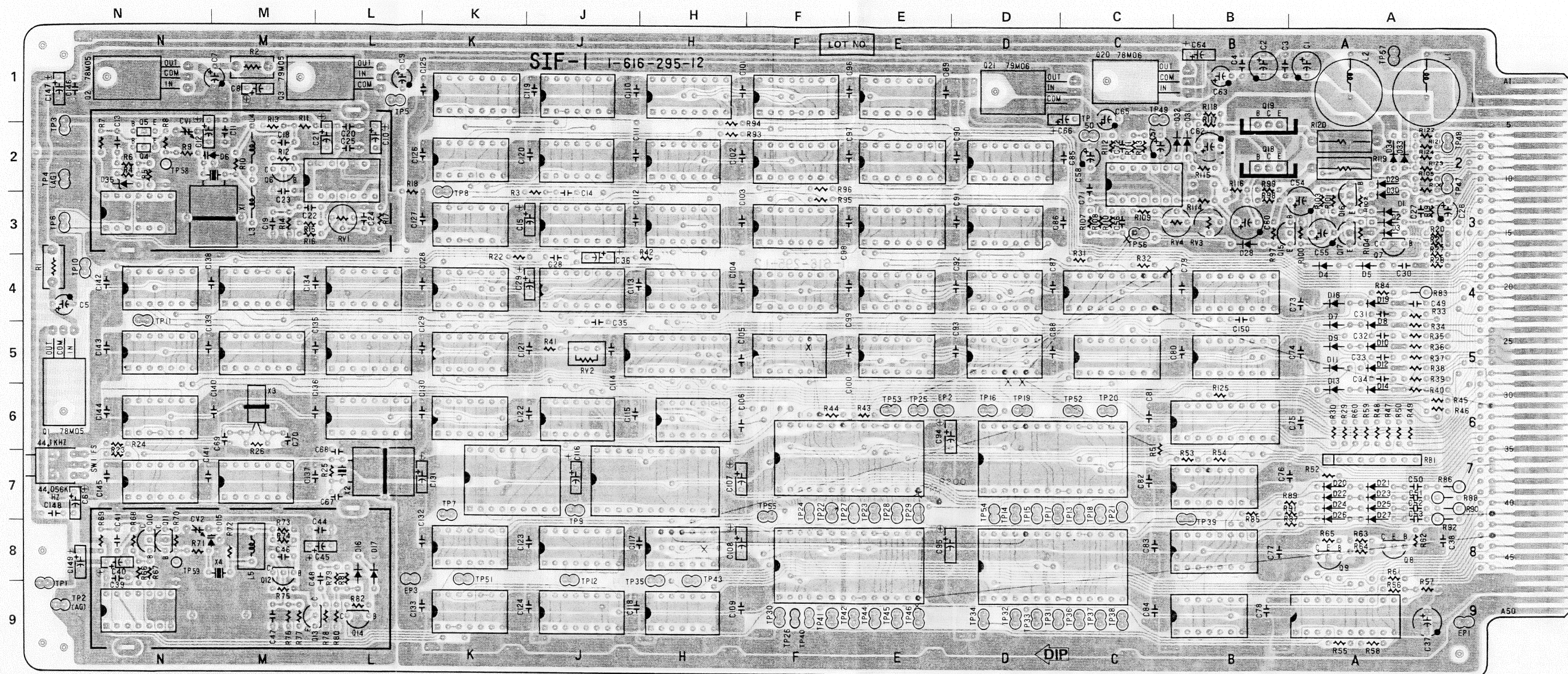
IC5F-9----R44
IC2E-1----IC3E-1
TP56----IC5D-6
IC4C-13----IC5D-4
IC5D-5----IC7B-13
IC4E-2----IC4D-8
IC4E-3----IC5D-10
IC4E-4----IC4E-14
IC4E-5----IC5D-12
IC5D-9----IC4E-9
TP55----IC5F-5
TP55----IC4D-2
IC6H-1----IC6H-14
IC6H-2----IC6H-3
IC6H-3----IC6H-4
IC6H-4----IC6H-7
IC6H-7----GND
IC6H-9----IC4C-15
IC6H-10----IC4C-14
IC6H-11----IC5E-11
IC6H-12----IC4E-9
IC6H-13----IC5D-3

Parts that have been added.

C150
IC6H

SIF-1 BOARD (1-616-295-12)
Component Side

S/N; J, U/C 10205 AND HIGHER
S/N; AEP 10127 AND HIGHER

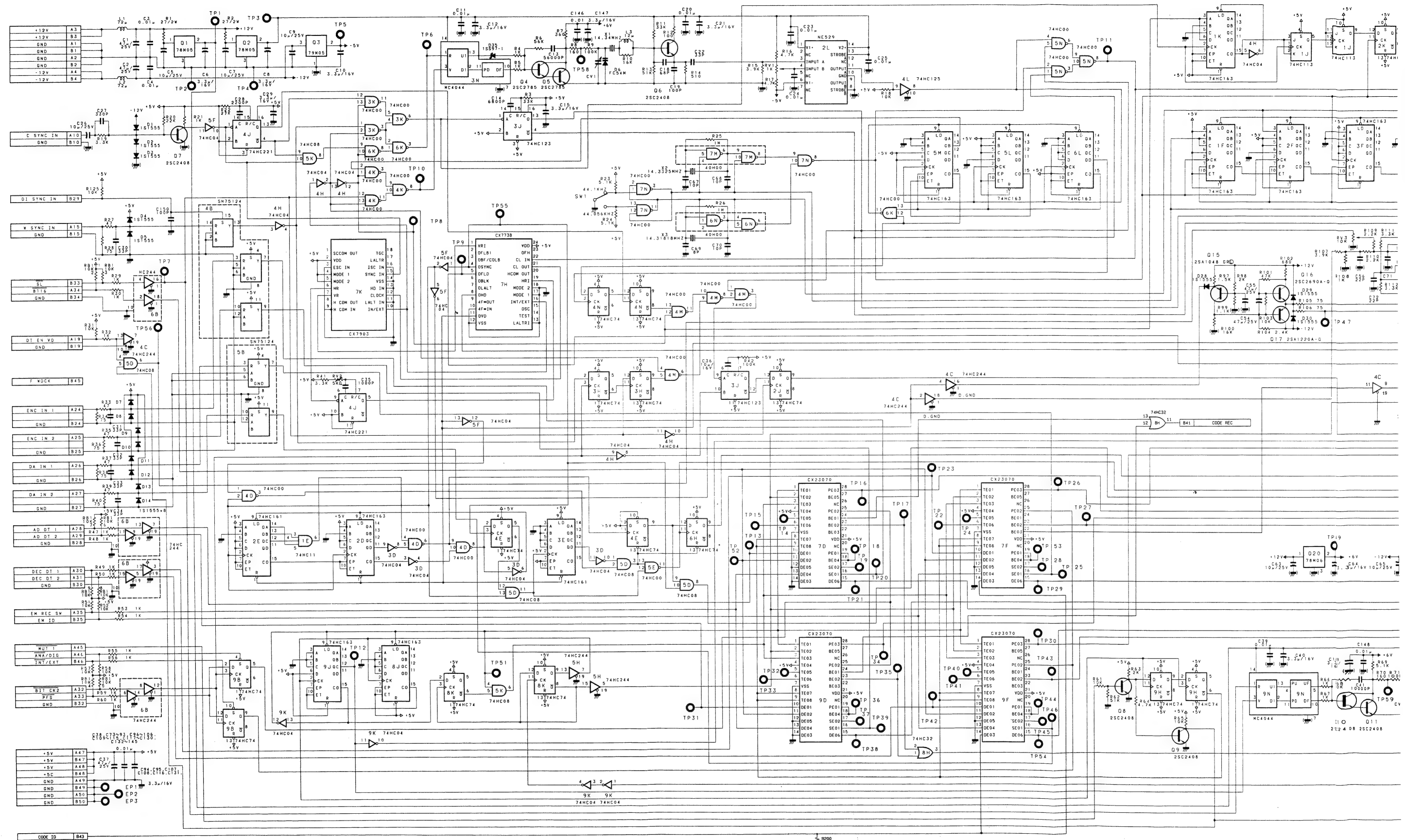


■ SOLDER SIDE PATTERN

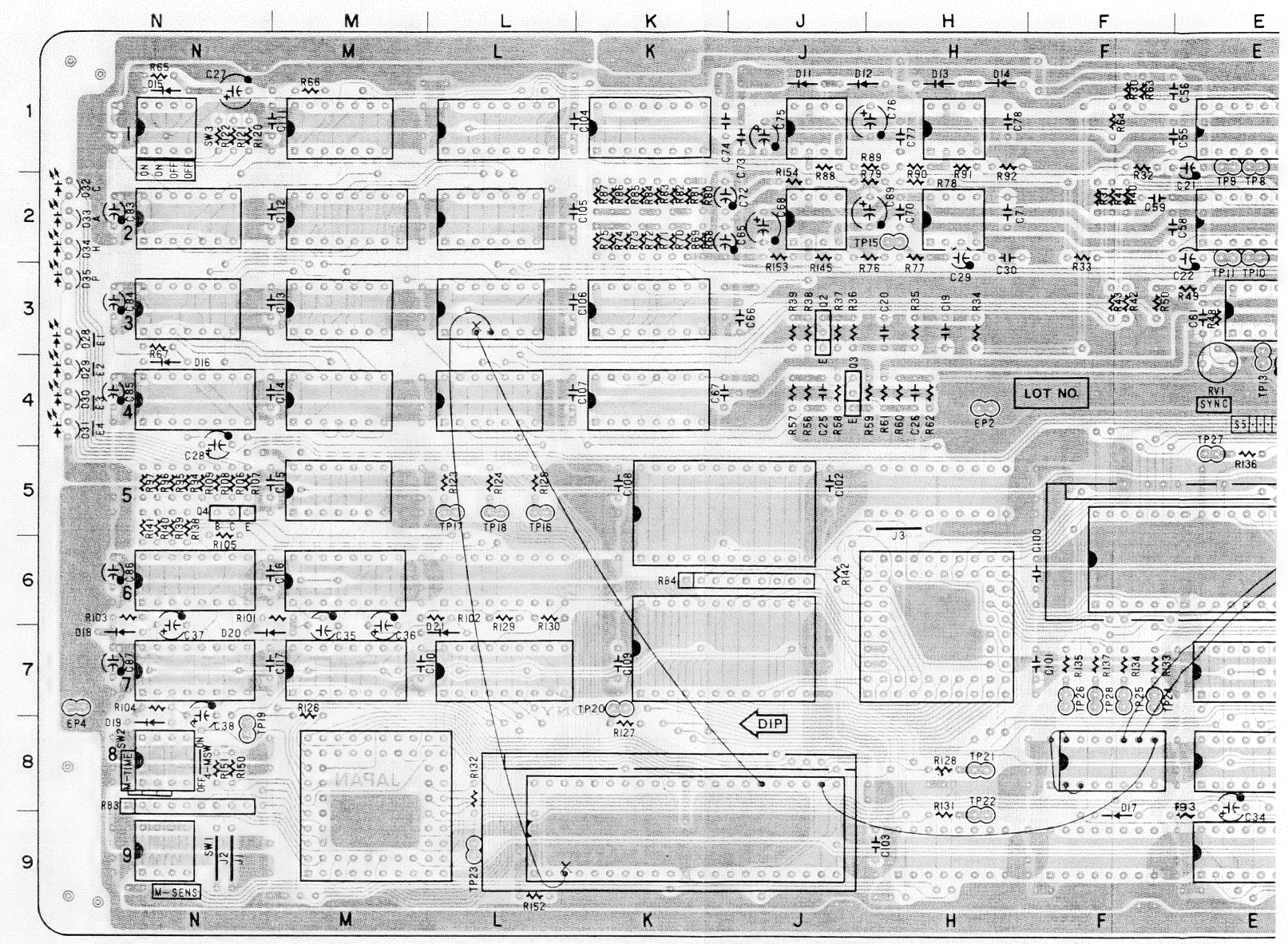
1-616-295-12

Applicable Serial No.	Traces that have been cut.	Jumpers that have been soldered.	A part that has been added.
J, U/C: 10205 and higher AEP : 10127 and higher	TP56----IC4C-7 IC5D-4----IC5D-5 IC5D-5----IC5D-7 IC5F-7----IC5F-9	IC5F-9----R44 IC5D-6----TP56 IC4C-13----IC5D-4 IC5D-5----IC7B-13	
J, U/C, AEP: 11301 and higher	IC4C-11 ---- GND	IC7F-22 ----IC4C-11 IC4C-9 ----B31	
J, U/C, AEP: 12801 and higher	IC7F-14 ----GND IC9F-14 ----GND IC8H-12 ----IC6H-9	IC8H-11 ----B41 IC9F-14 ----B43 IC7D-24 ----IC8H-13 IC7F-14 ----IC9F-14 IC9D-24 ----IC8H-12	R200

SIF-1 BOARD
System Interface



DEC-15 BOARD (1-616-296-11)
Component Side

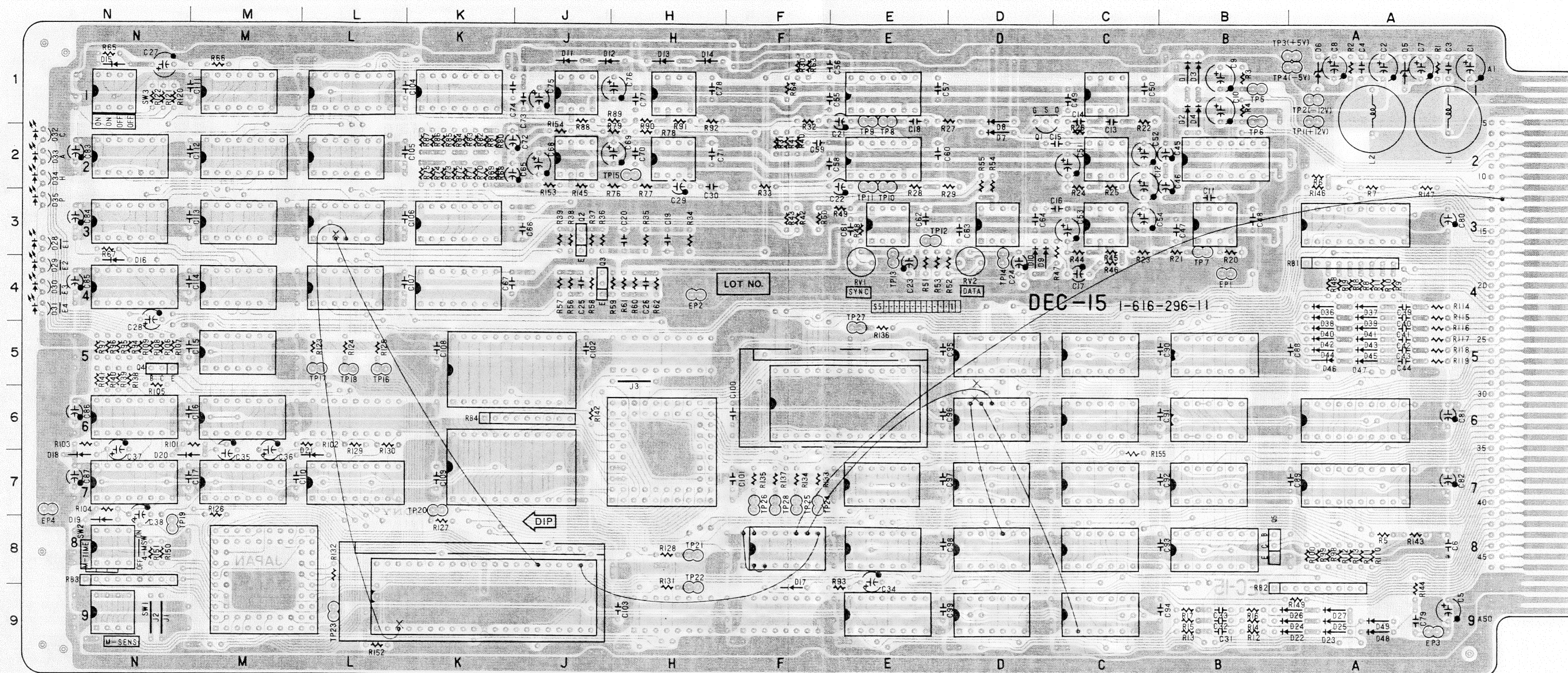


■ SOLDER SIDE PATTERN 1-616-296-11
■ COMPONENT SIDE PATTERN 1-616-296-11

Applicable Serial NO.	Pa
10205 and higher	
12201 and higher	

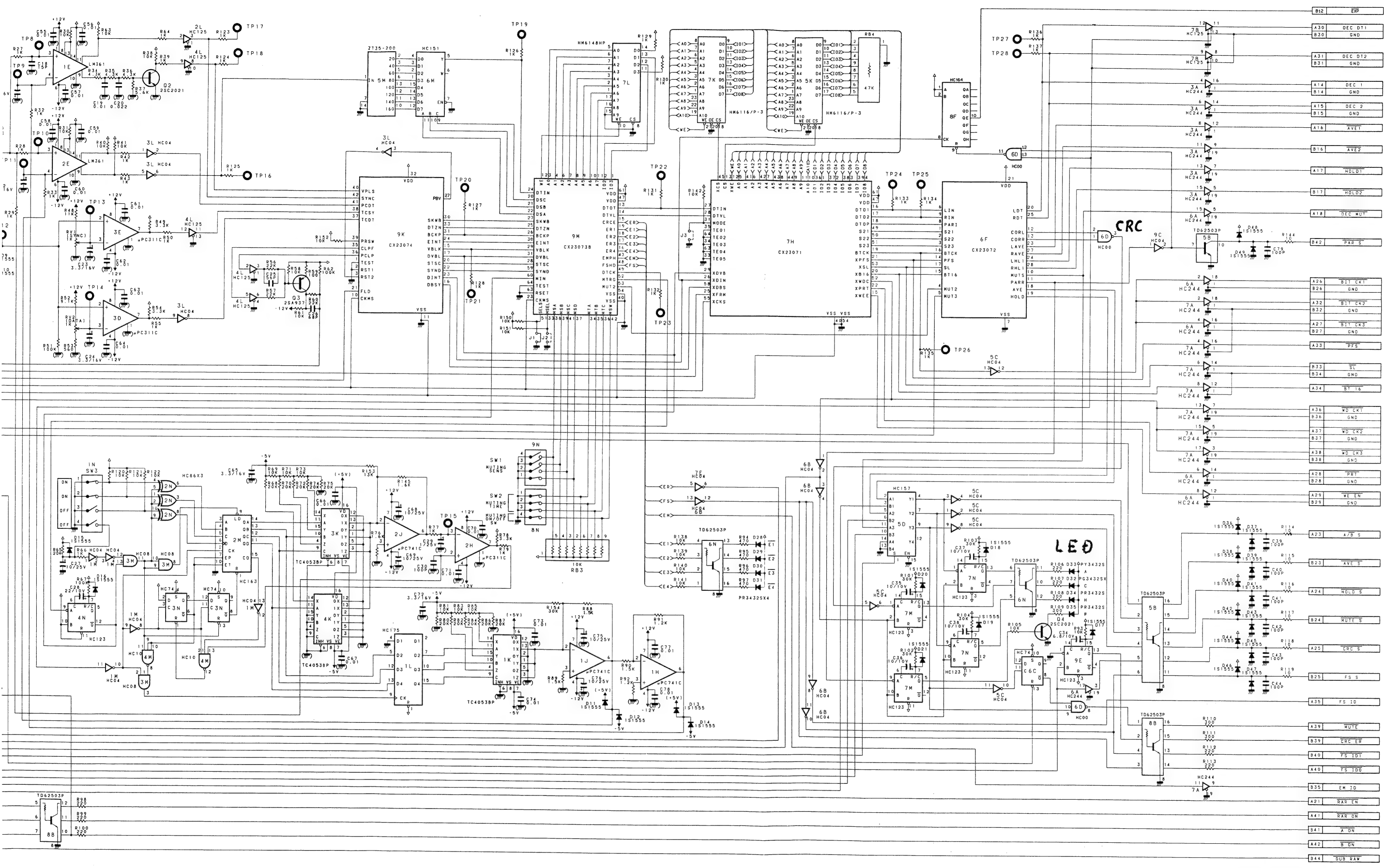
C-24

DEC-15 BOARD (1-616-296-11)
Component Side



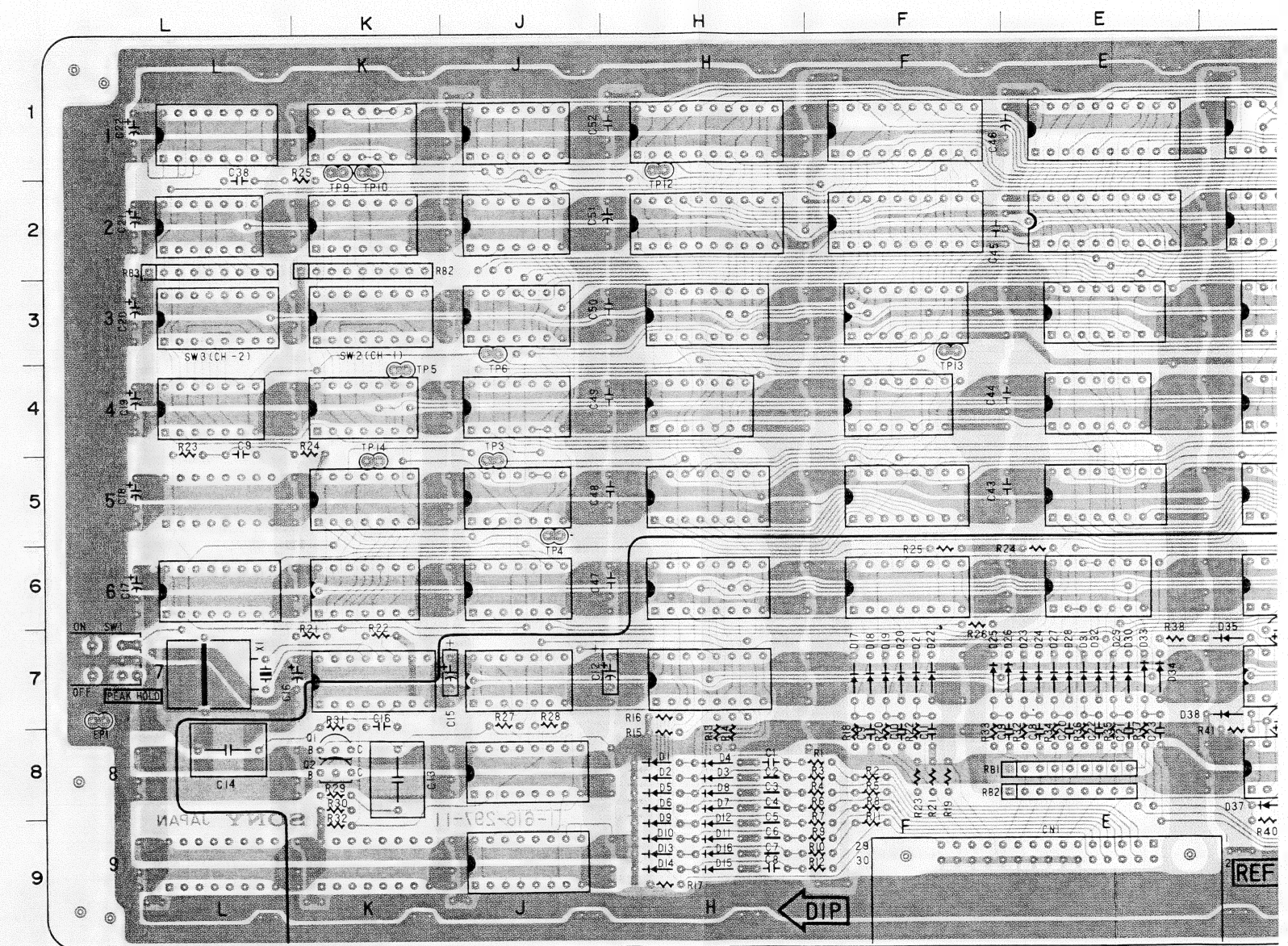
■ SOLDER SIDE PATTERN 1-616-296-11
■ COMPONENT SIDE PATTERN 1-616-296-11

Applicable Serial NO.	Part that has been added.	Traces that have been cut.	Jumpers that have been soldered.
10205 and higher	_____	IC3L-3----- GND IC9K-3----- GND	IC3L-3-----IC9K-25 IC3L-4 ----- IC9K-3
12201 and higher	IC8F-----MC74HC164N	IC6D-12----- GND IC6D-12----- IC6D-13	IC3L-3 ----- IC9K-27 IC8F-1, 2, 14 --- +5V IC8D-10 ----- IC6D-13 IC8F-8 ----- IC9K-23 IC8F-9 ----- IC6D-11 IC8F-10 ----- CNB12 IC9C-2 ----- IC6D-12



DEC-15 BOARD
BOARD NO. 1-615-296-11 & HIGHER
PCM-1530 SERIAL NO. 10001 and higher

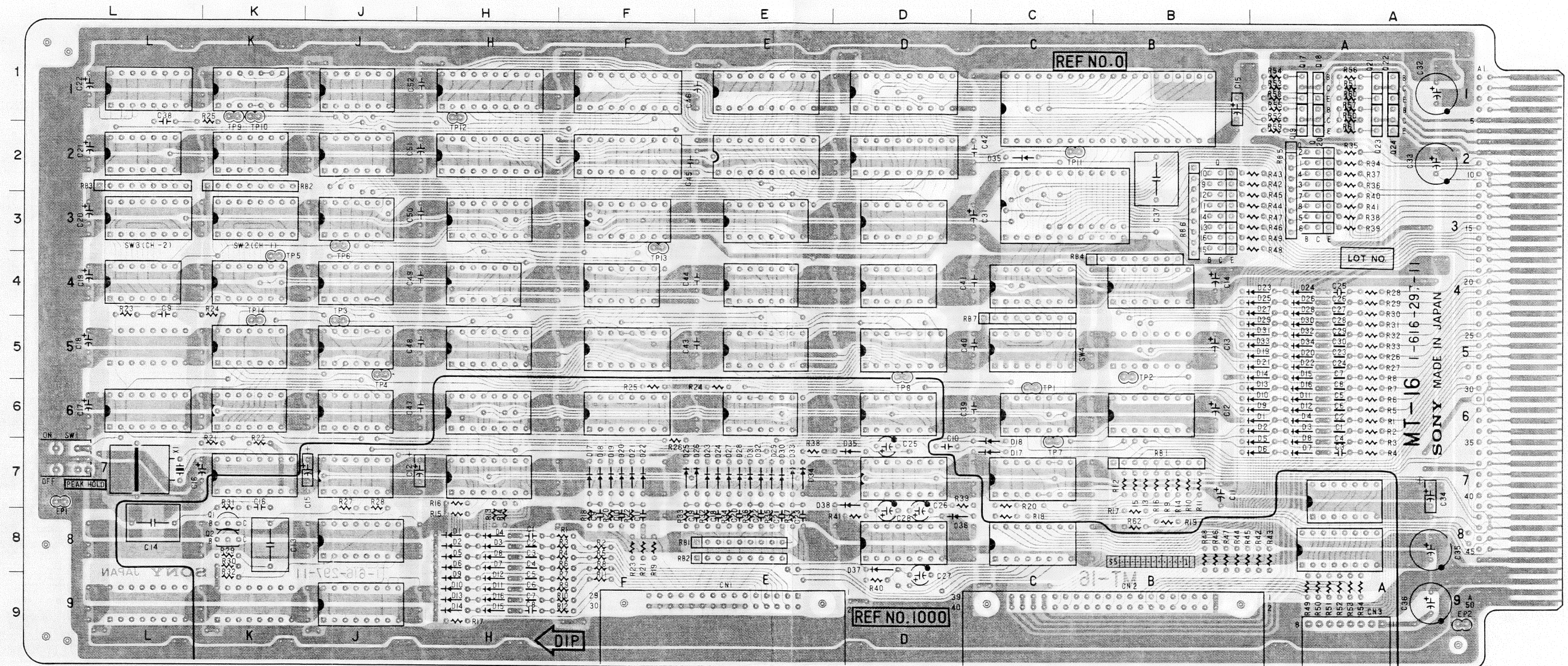
MT-16 BOARD (1-616-297-11)
Component Side



■ SOLDER SIDE PATTERN 1-616-297-11
■ COMPONENT SIDE PATTERN 1-616-297-11

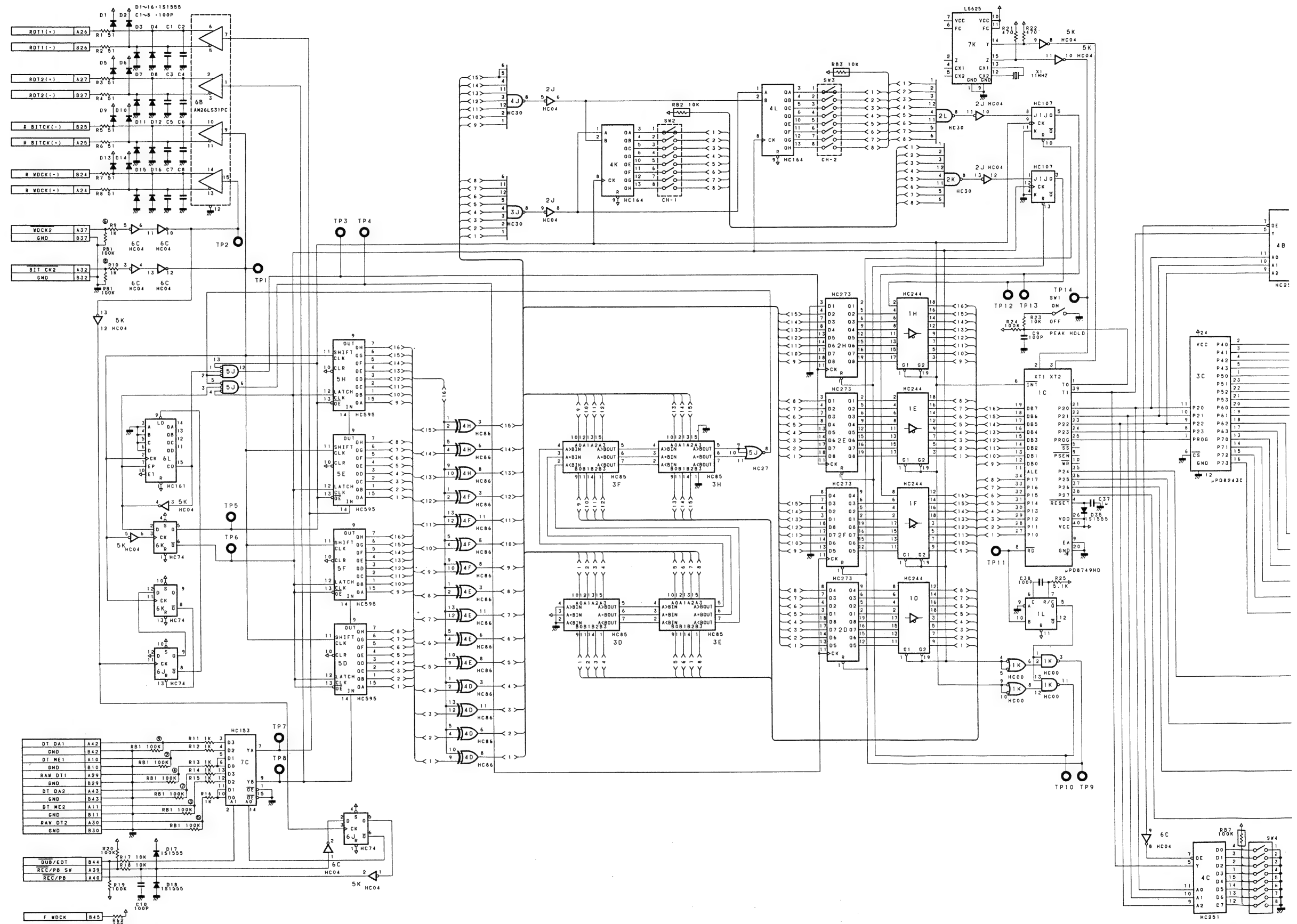
C-30

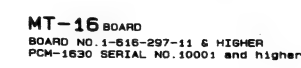
MT-16 BOARD (1-616-297-11)
Component Side



■ SOLDER SIDE PATTERN 1-616-297-11
■ COMPONENT SIDE PATTERN 1-616-297-11

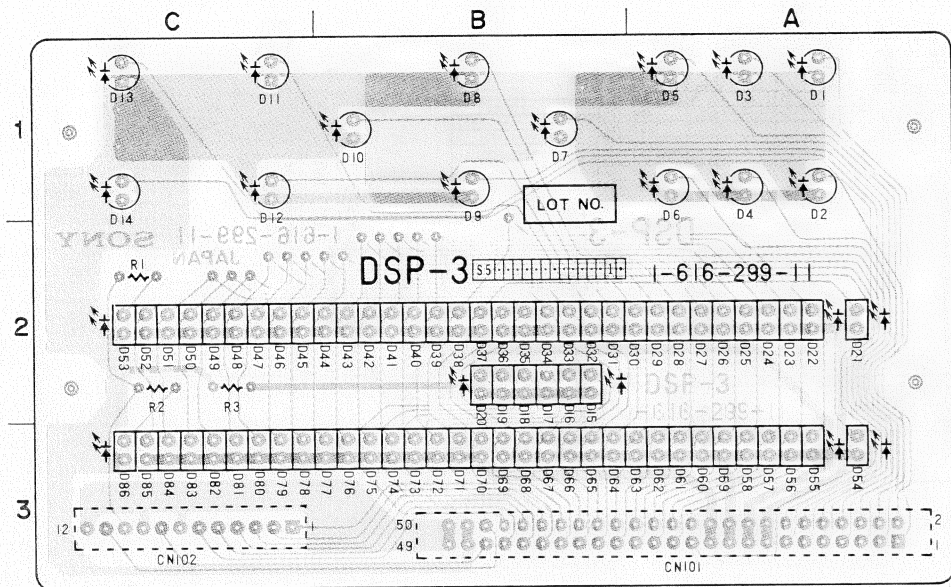
MT-16 BOARD
Meter Control



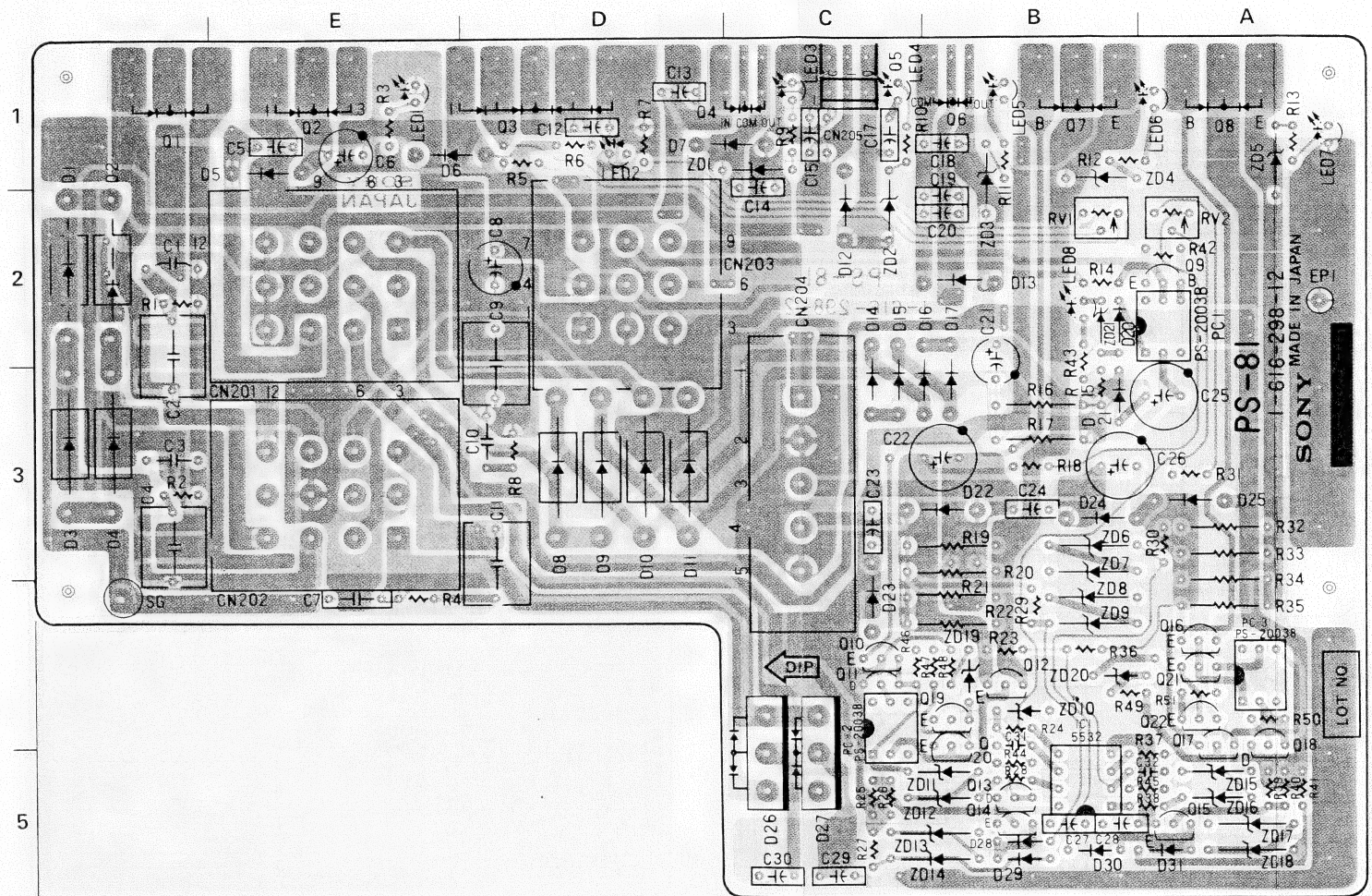


DSP-3 BOARD (1-616-299-11)
Component Side

PS-81 BOARD (1-616-298-12)
Component Side

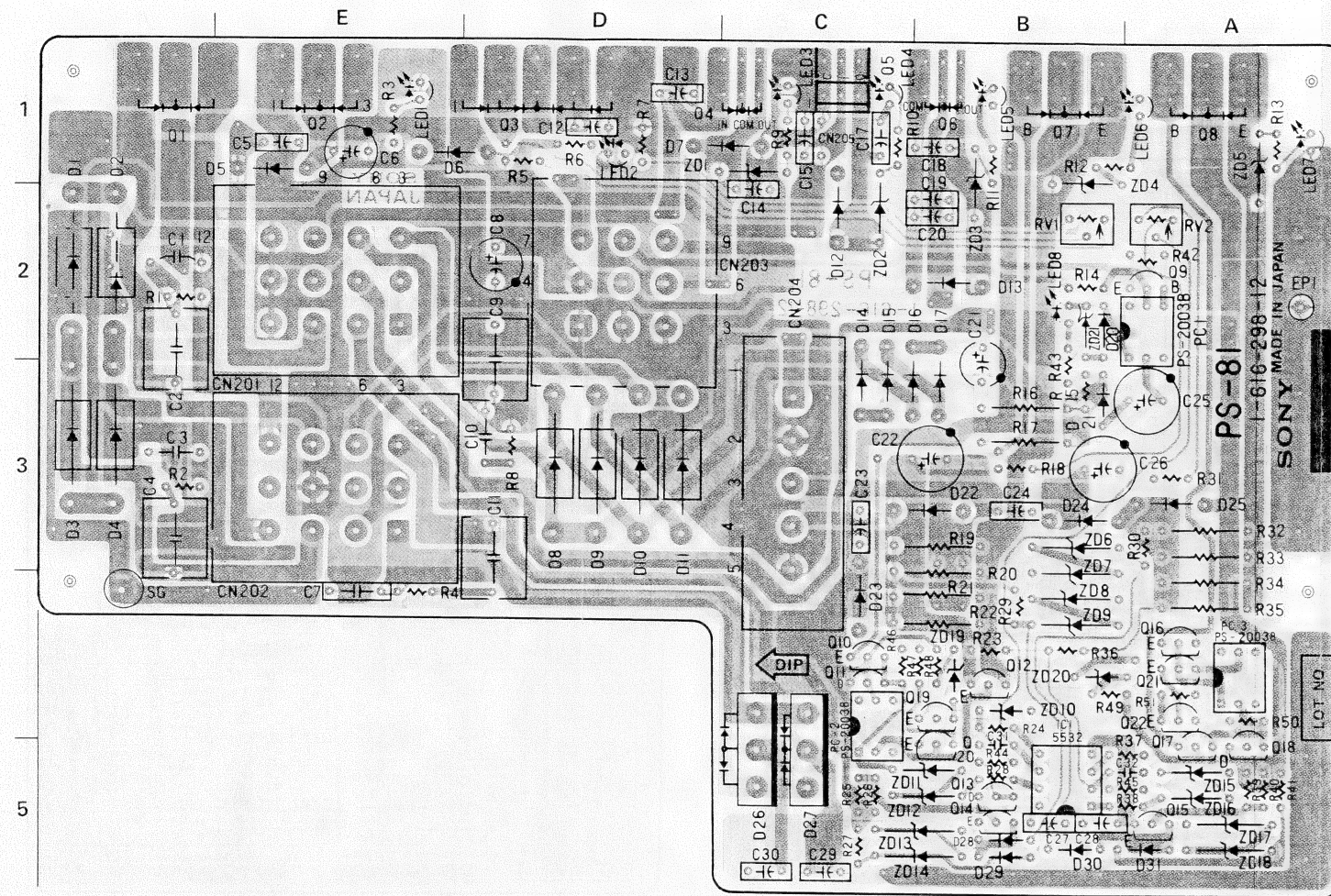


■ SOLDER SIDE PATTERN 1-616-299-11
■ COMPONENT SIDE PATTERN 1-616-299-11



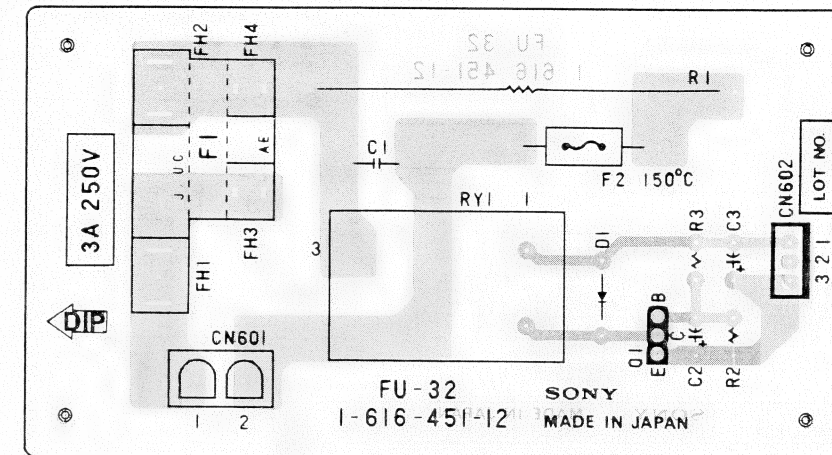
■ SOLDER SIDE PATTERN 1-616-298-12
■ COMPONENT SIDE PATTERN 1-616-298-12

PS-81 BOARD (1-616-298-12)
Component Side

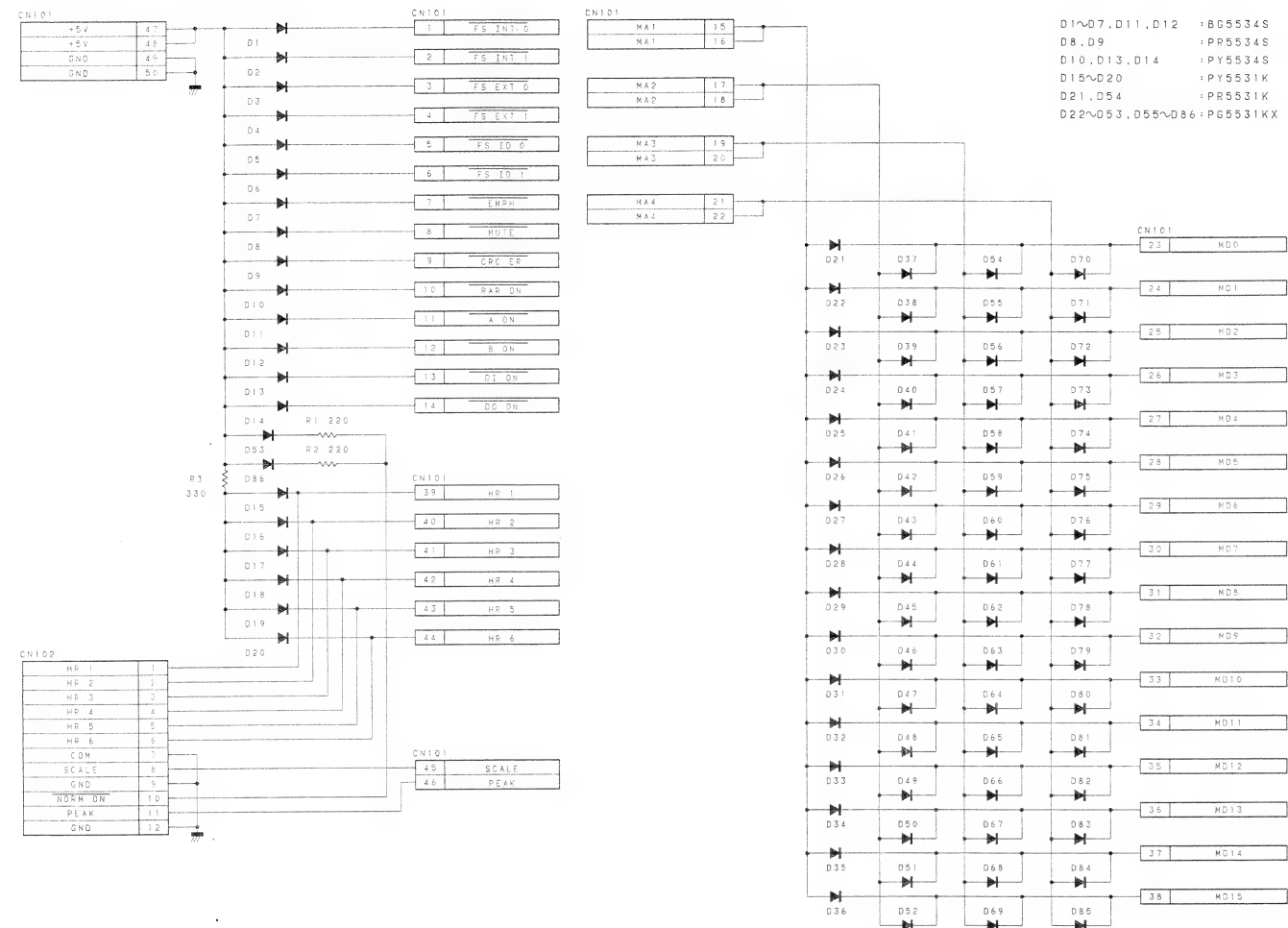


■ SOLDER SIDE PATTERN 1-616-298-12
■ COMPONENT SIDE PATTERN 1-616-298-13

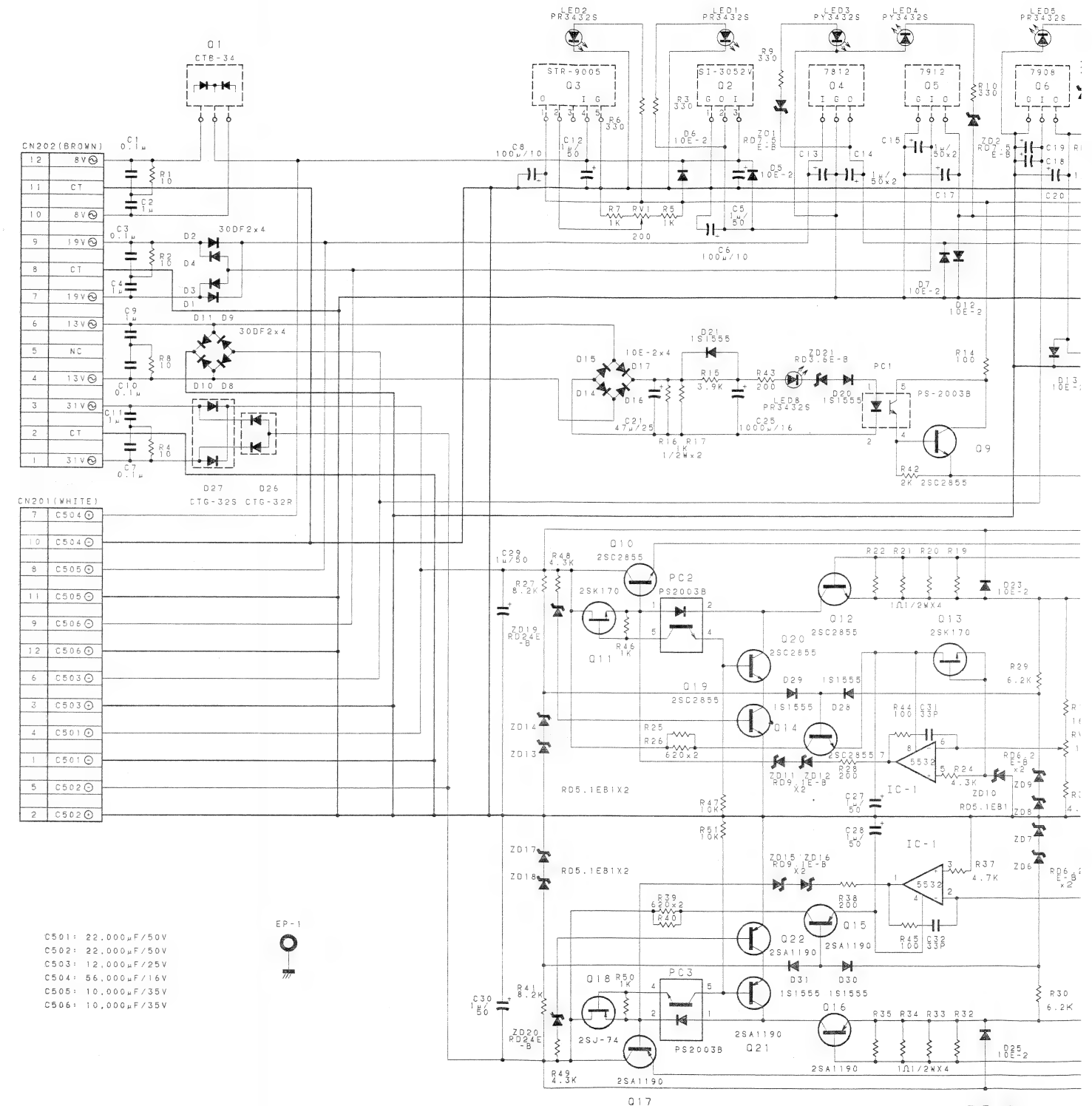
FU-32 BOARD (1-616-451-12)
Component Side



DSP-3 BOARD
Display



PS-81 BOARD
Power Supply



PS-81 BOARD
Power Supply

2 : BG5534S
: PR5534S
: PY5534S
: PY5531K
: PR5531K
D86 : PG5531KX

MD0

MD1

MD2

MD3

MD4

MD5

MD6

MD7

MD8

MD9

MD10

MD11

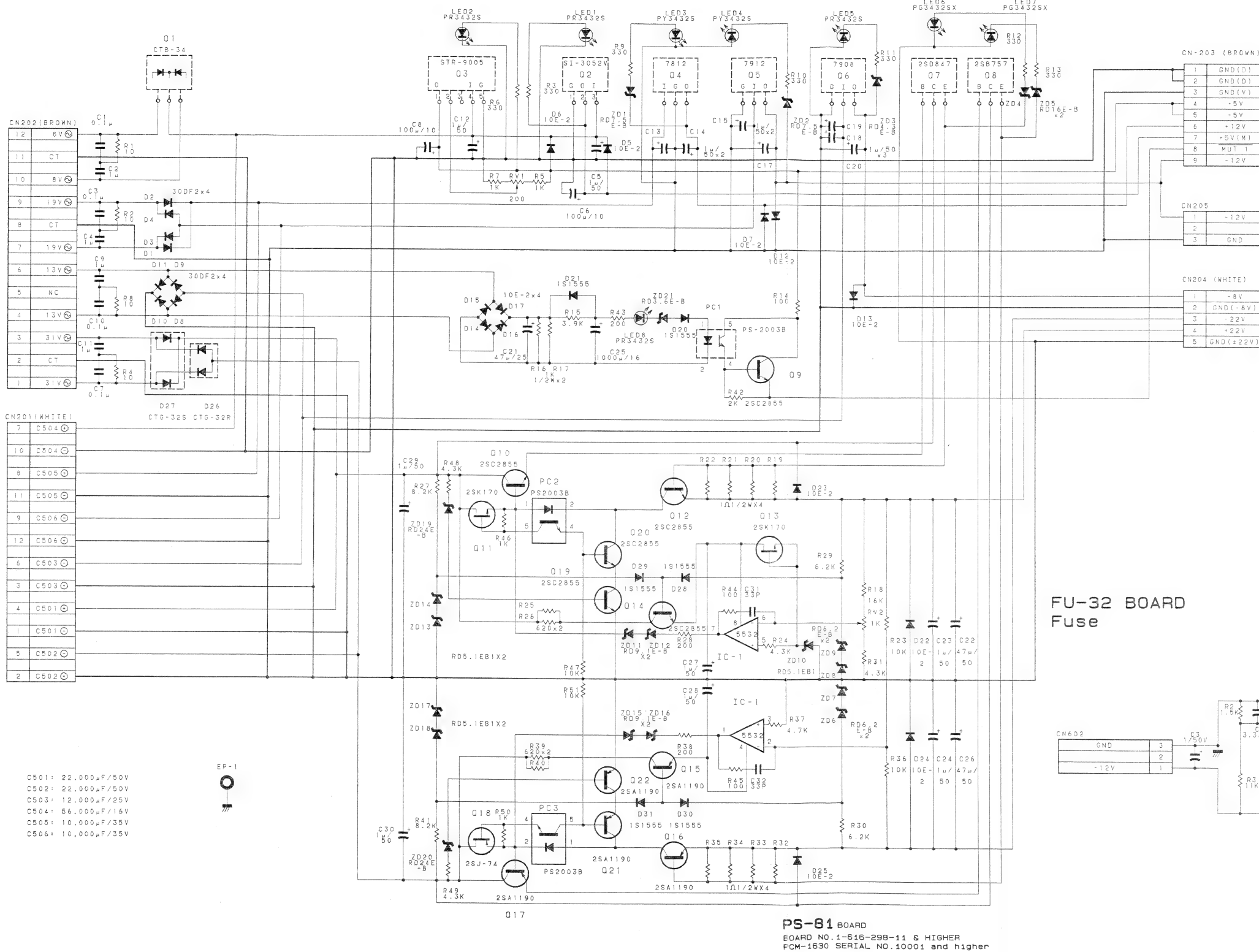
MD12

MD13

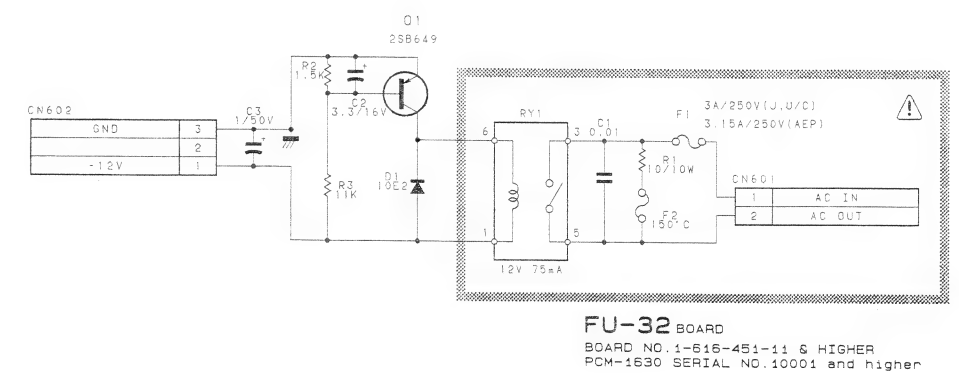
MD14

MD15

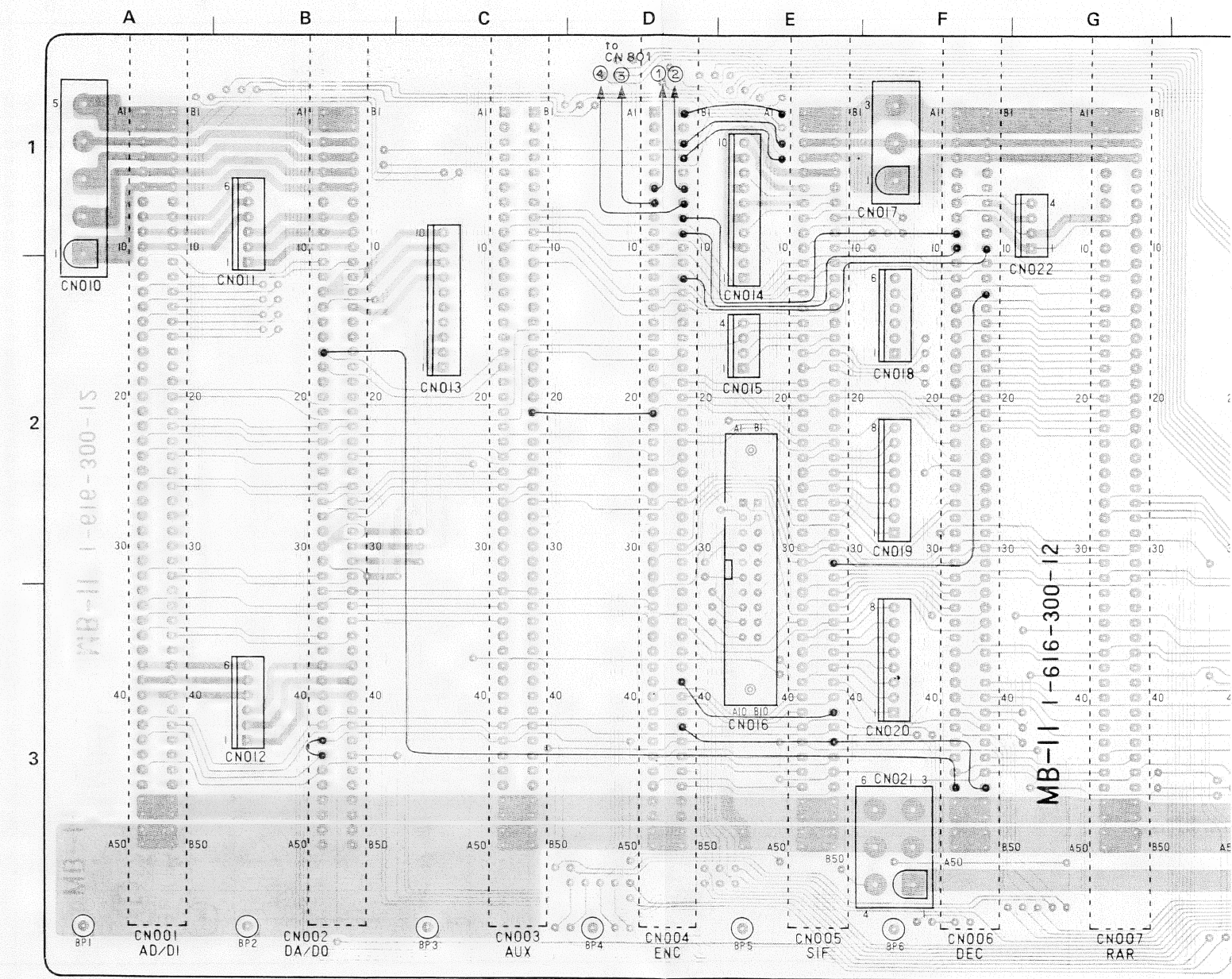
11 & HIGHER
10001 and higher



FU-32 BOARD
Fuse



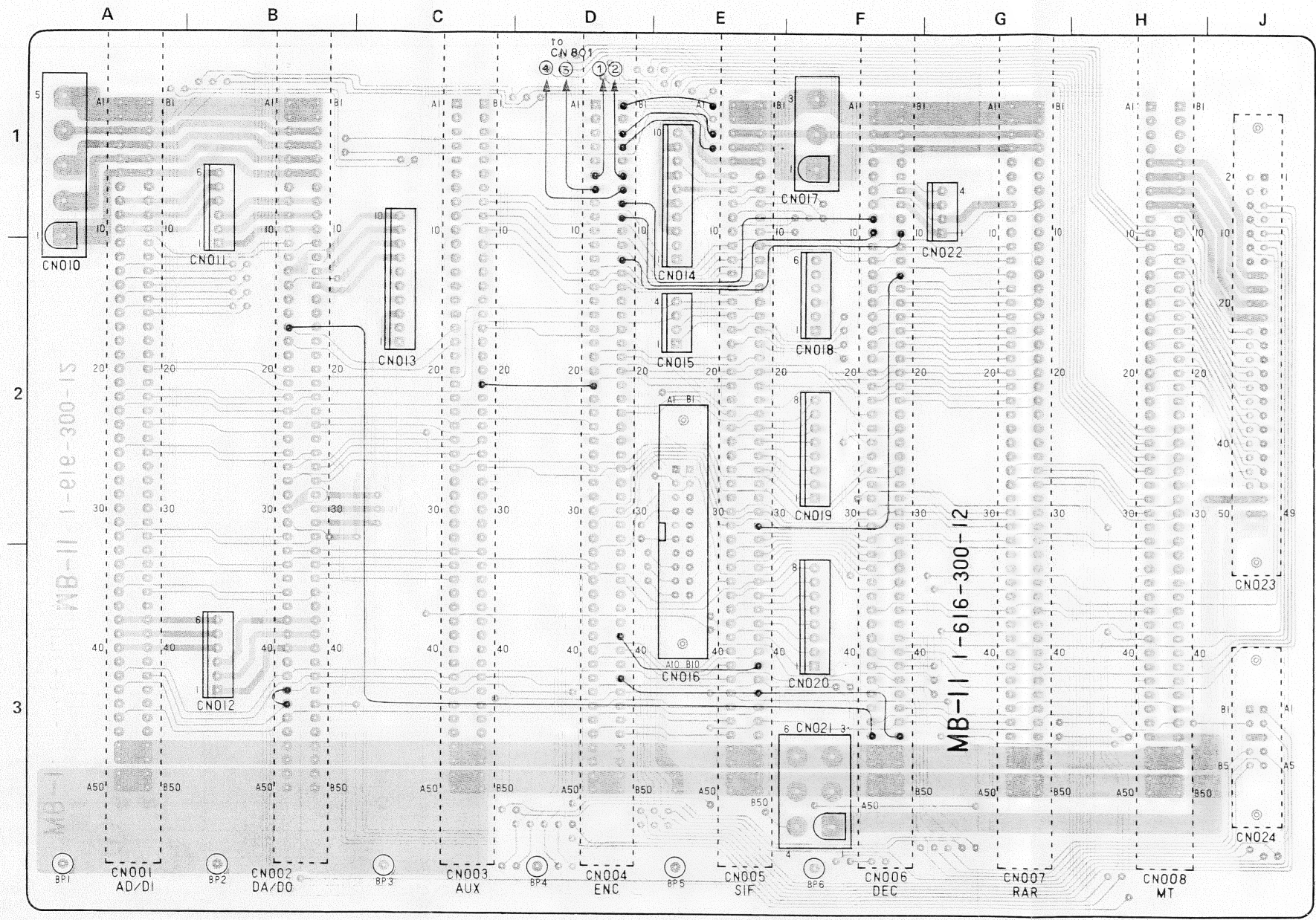
MB-11 BOARD (1-616-300-12)
Solder Side



COMPONENT SIDE PATTERN 1-616-300-12
SOLDER SIDE PATTERN 1-616-300-12

C-42

MB-11 BOARD (1-616-300-12)
Solder Side



■ COMPONENT SIDE PATTERN 1-616-300-12

Applicable Serial No.	Jumpers that have been soldered.
J, U/C, AEP: 11301 and higher	CN005-B31---- CN006-B13 CN002-A43---- CN002-A44 CN003-B21---- CN004-A21
J, U/C, AEP: 12801 and higher	CN002-A17---- CN006-A46 CN004-B1---- CN005-A1 CN004-B3---- CN005-A3 CN004-B4---- CN005-A4 CN004-B8---- CN006-A9 CN004-B9---- CN006-A10 CN004-B12---- CN006-B10 CN004-B39---- CN005-B41 CN004-B42---- CN005-B43 CN005-B43---- CN006-B46 CN004-A6---- CN801 ① CN004-B6---- CN801 ② CN004-A7---- CN801 ③ CN004-B7---- CN801 ④

MB-11 BOARD (1/2)
Mother BoardCN001
AD (DI)

COMPONENT SIDE				SOLDERING SIDE			
DESTINATION	I/O	NAME	A/B	NAME	I/O	DESTINATION	
CN010 ⑤	I	GND	1	GND	I	CN010 ⑤	
CN010 ⑤	I	GND	2	GND	I	CN010 ⑤	
CN010 ④	I	+22V	3	+22V	I	CN010 ④	
CN010 ③	I	-22V	4	-22V	I	CN010 ③	
CN010 ②	I	GND	5	GND	I	CN010 ②	
CN010 ①	I	-8V	6	-8V	I	CN010 ①	
			7				
CN011 ⑥	I	A IN1(+)	8	A IN1(+)	I	CN011 ⑥	
CN011 ⑤	I	A IN1(-)	9	A IN1(-)	I	CN011 ⑤	
CN011 ④	I	A IN1(G)	10	A IN1(G)	I	CN011 ④	
DA A11	O	REC MON1	11	GND	O	DA B11	
			12				
AUX A13	I	FIL BITCK	13	GND	I	AUX B13	
AUX A14	I	FIL WDCK	14	GND	I	AUX B14	
AUX A15	O	AD FIL1	15	GND	O	AUX B15	
AUX A16	O	AD FIL2	16	GND	O	AUX B16	
			17				
			18	TEST1	I	AUX B18	
			19	FIL ON	I	AUX B19	
CN015 ④	I	W SYNC IN	20	GND	I	CN015 ③	
			21				
SIF A22	I	IO CK	22	GND	I	SIF B22	
SIF A23	I	IO SYNC	23				
AUX A24	ENC A24	DI EN	24	DI SYNC	O	SIF B29	
			25				
DEC A26	I	BIT CK1	26	GND	I	DEC B26	
			27				
SIF A28	O	AD DT1	28	GND	O	SIF B28	
SIF A29	O	AD DT2	29	GND	O		
			30				
			31				
DA A32	O	REC MON2	32	GND	O	DA B32	
			33				
ENC A34	I	EM PB SW	34				
SIF A35	ENC A35	EM REC SW	35				
DEC A36	I	WD CK1	36	GND	I	DEC B36	
			37				
CN012 ⑥	I	A IN2(+)	38	A IN2(+)	I	CN012 ⑥	
CN012 ⑤	I	A IN2(-)	39	A IN2(-)	I	CN012 ⑤	
CN012 ④	I	A IN2(G)	40	A IN2(G)	I	CN012 ④	
			41				
SIF A42	I	DT DA1	42	GND	I	SIF B42	
SIF A43	I	DT DA2	43	GND	I		
			44				
CN021 ④	I	MUT1	45				
			46				
DA A47·48,B47·48	I	+5V	47	+5V	I	DA A47·48,B47·48	
DA A47·48,B47·48	I	+5V	48	+5V	I	DA A47·48,B47·48	
DA A49·50,B49·50	I	GND	49	GND	I	DA A49·50,B49·50	
DA A49·50,B49·50	I	GND	50	GND	I	DA A49·50,B49·50	

CN002
DA (DO)

COMPONENT SIDE				SOLDERING SIDE			
DESTINATION	I/O	NAME	A/B	NAME	I/O	DESTINATION	
CN010 ⑤	I	GND	1	GND	I	CN010 ⑤	
CN010 ⑤	I	GND	2	GND	I	CN010 ⑤	
CN010 ④	I	+22V	3	+22V	I	CN010 ④	
CN010 ③	I	-22V	4	-22V	I	CN010 ③	
CN010 ②	I	GND	5	GND	I	CN010 ②	
CN010 ①	I	-8V	6	-8V	I	CN010 ①	
			7				
CN011 ③	O	A OUT1(+)	8	A OUT1(+)	O	CN011 ③	
CN011 ②	O	A OUT1(-)	9	A OUT1(-)	O	CN011 ②	
CN011 ①	O	A OUT1(G)	10	A OUT1(G)	O	CN011 ①	
AD A11	I	REC MON1	11	GND	I	AD B11	
			12				
CN013 ⑩	O	MON1	13	GND	O	CN013 ⑨ ⑥	
CN013 ⑧	O	LVL OUT1	14	LVL IN1	I	CN013 ⑦	
			15				
			16				
DEC A46	AUX A17	TEST4	17				
AUX A18	I	TEST2	18				
			19				
			20				
			21				
SIF A22	I	IO CK	22	GND	I	SIF B22	
SIF A23	I	IO SYNC	23				
			24	DO EN	O	ENC B24	
			25				
DEC A26	I	BIT CK1	26	GND	I	DEC B26	
RAR A27	I	RAW DT1	27	GND	I	RAR B27	
RAR A28	I	RAW DT2	28	GND	I	RAR B28	
			29				
CN013 ②	O	MON2	30	GND	O	CN013 ① ③	
CN013 ⑤	O	LVL OUT2	31	LVL IN2	I	CN013 ④	
AD A32	I	REC MON2	32	GND	I	AD B32	
AUX A·B33	I	GND	33	GND	I	AUX A·B33	
ENC A34	I	EM PB SW	34	TST DA1	I	AUX A34	
	O	EM PB SW	35	TST DA2	I	AUX A35	
DEC A36	I	WD CK1	36	GND	I	DEC B36	
			37				
CN012 ③	O	A OUT2(+)	38	A OUT2(+)	O	CN012 ③	
CN012 ②	O	A OUT2(-)	39	A OUT2(-)	O	CN012 ②	
CN012 ①	O	A OUT2(G)	40	A OUT2(G)	O	CN012 ①	
MT A40	I	REC/PB	41				
SIF A42	I	DT DA1	42	GND	I	SIF B42	
SIF A43	I	DT DA2	43	GND	I		
			44	DUB/EDT	I	RAR A44	
CN021 ④	I	MUT1	45				
			46				
AUX A47·48,B47·48	I	+5V	47	+5V	I	AUX A47·48,B47·48	
AUX A47·48,B47·48	I	+5V	48	+5V	I	AUX A47·48,B47·48	
AUX A49·50,B49·50	I	GND	49	GND	I	AUX A49·50,B49·50	
AUX A49·50,B49·50	I	GND	50	GND	I	AUX A49·50,B49·50	

CN003
(AUX)

COMPONENT SIDE				SOLDERING SIDE			
DESTINATION	I/O	NAME	A/B	NAME	I/O	DESTINATION	
			1				
			2				
			3				
			4				
			5				
			6				
			7				
SIF A11	I	FLD D/E	8	GND	I	SIF B11	
SIF A12	I	VD	9	HD	I	SIF B12	
SIF A13	I	VBLK1	10	GND	I	SIF B13	
			11	INT BLK	I	SIF B14	
			12				
AD A13	O	FIL BIT CK	13	GND	O	AD B13	
AD A14	O	FIL WD CK	14	GND	O	AD B14	
AD A15	I	AD FIL1	15	GND	I	AD B15	
AD A16	I	AD FIL2	16	GND	I	AD B16	
DA A17	O	TEST4	17	TEST3	O	ENC B17	
DA A18	O	TEST2	18	TEST1	O	AD B18	
			19	FIL ON	O	AD B19	
			20				
			21				
			22				
			23				
AD A24	I	DI EN	24				
RAR A27	I	RAW DT1	25	GND	I	RAR B27	
RAR A28	I	RAW DT2	26	GND	I	RAR B28	
DEC A27	I	BIT CK3	27	GND	I	DEC B27	
SIF A28	O	AD DT1	28	GND	O	SIF B28	
SIF A29	O	AD DT2	29	GND	O		
			30				
			31				
			32				
DA A·B33	O	GND	33	GND	O	DA A·B33	
DA B34	O	TST DA1	34				
DA B35	O	TST DA2	35				
			36				
			37				
DEC A38	I	WD CK3	38	GND	I	DEC B38	
			39				
			40				
			41				
SIF A42	I	DT DA1	42	GND	I	SIF B42	
SIF A43	I	DT DA2	43	GND	I		
			44				
			45	F WDCK	O	ENC B43	SIF·DEC·RAR·MT B45
			46				
ENC A47·48,B47·48	I	+5V	47	+5V	I	ENC A47·48,B47·48	
ENC A47·48,B47·48	I	+5V	48	+5V	I	ENC A47·48,B47·48	
ENC A49·50,B49·50	I	GND	49	GND	I	ENC A49·50,B49·50	
ENC A49·50,B49·50	I	GND	50	GND	I	ENC A49·50,B49·50	

CN004
ENC

COMPONENT SIDE				SOLDERING SIDE			
DESTINATION	I/O	NAME	A/B	NAME	I/O	DESTINATION	
				1 GND	I	CN017 ③	
				2			
				3 +12V	I	CN017 ②	
				4 -12V	I	CN017 ①	
				5			
*5	CN001 ①	I	TC IN (X)	6 TC IN (G)	I	CN001 ②	*7
*5	CN001 ③	O	TC OUT (X)	7 TC OUT (G)	O	CN001 ④	*8
				8 TC DELAY ON	I	DEC A9	*9
				9 ENC SI	O	DEC A10	*10
	MT A10	O	DT ME1	10 GND	O	MT B10	
	MT A11	O	DT ME2	11 GND	O	MT B11	
				12 DUB	O	DEC B10	
	SIF A13	I	VBLK1	13 GND	I	SIF B13	*11
	SIF A14	I	BK SYNC	14 INT BLK	I	SIF B14	
				15			
				16			
				17 TEST3	I	AUX B17	
				18			
	SIF A19	O	DT EN VO	19 GND	O	SIF B19	
	SIF A20	I	CK MST	20 GND	I	SIF B20	
	SIF A21	I	DFRM	21			
				22			
				23 DIO EN	O	SIF B23	
	AD A24	I	DI EN	24 DO EN	I	DA B24	
				25			
				26			
	DEC A27	I	BIT CK3	27 GND	I	DEC B27	
	DEC A28	I	PRT	28 GND	I	DEC B28	
	DEC A29	I	WE EN	29 GND	I	DEC B29	
	RAR A30	DEC A30	I	DEC DT1	30 GND	I	DEC B30 RAR B30
	RAR A31	DEC A31	I	DEC DT2	31 GND		
				32			
	CN016 B2	O	EMPH S	33			
	MT A34	DA A34	AD A34	O	EM PB SW	34	EM ENC O MT B34
				35	EM ID	I	DEC B35
	CN023 ⑦	O	EMPH	36			
	CN023 ⑬	O	DI ON	37	DO ON	O	CN023 ⑭
				38			
				39 CODE REC	I	SIF B41	*12
	SIF A40	I	DT EN1	40 GND	I	SIF B40	
	SIF A41	I	DT EN2	41	GND		
				42 CODE ID	I	SIF B43 DEC B46	*13
	CN024 A1	I	DUBB	43 F WCK	I	AUX B45	
	SIF A44	I	EM REC	44	EM PB	I	SIF B44
	CN024 A2	I	ANA/DIG SW	45	INT/EXT SW	I	CN024 A4
	SIF A46	O	ANA/DIG	46	INT/EXT	O	SIF B46
	SIF A47-48, B47-48	I	+5V	47	+5V	I	SIF A47-48, B47-48
	SIF A47-48, B47-48	I	+5V	48	+5V	I	SIF A47-48, B47-48
	SIF A49-50, B49-50	I	GND	49	GND	I	SIF A49-50, B49-50
	SIF A49-50, B49-50	I	GND	50	GND	I	SIF A49-50, B49-50

CN005
SIF

COMPONENT SIDE				SOLDERING SIDE			
DESTINATION	I/O	NAME	A/B	NAME	I/O	DESTINATION	
CN014 ⑥	I	GND	1	GND	I	CN017 ③	
CN018 ⑥	I	GND	2	GND	I	CN017 ③	
CN018 ④	I	+12V	3	+12V	I	CN017 ②	
CN018 ②	I	-12V	4	-12V	I	CN017 ①	
CN014 ⑨ ⑦ ⑤ ③	O	GND	5	GND	O	CN014 ⑨ ⑦ ⑤ ③	
CN014 ⑩	O	V PCM OUT 1	6	V PCM OUT 2	O	CN014 ⑧	
CN014 ⑥	O	V PCM OUT 3	7	V PCM OUT 4	O	CN014 ④	
CN018 ⑥	O	C SYNC DT 1	8	GND	O	CN018 ⑤ ③	
CN018 ④	O	C SYNC DT 2	9				
CN018 ②	I	C SYNC IN	10	GND	I	CN018 ①	
AUX A8	RAR A11	DEC A11	O	FLD O/E	11	GND	O
AUX A9	RAR A12	DEC A12	O	VD	12	HD	O
	AUX A10	ENC A13	O	V BLK 1	13	GND	O
		ENC A14	O	BK SYNC	14	INT BLK	O
CN015 ④	I	W SYNC IN	15	GND	I	CN015 ③	
CN015 ②	O	W SYNC OUT	16	GND	O	CN015 ①	
CN023 ①	O	FS INT 0	17	FS INT 1	O	CN023 ②	
CN023 ③	O	FS EXT 0	18	FS EXT 1	O	CN023 ④	
	ENC A19	I	DT EN VO	19	GND	I	ENC B19
RAR A20	DEC A20	ENC A20	O	CK MST	20	GND	O
	AUX B21	ENC A21	O	DFRM	21	MUT 3	O
	DA A22	AD A22	O	IO CK	22	GND	O
	DA A23	AD A23	O	IO SYNC	23	DIO EN	I
CN019 ⑧	I	ENC IN1	24	GND	I	CN019 ⑦	
CN019 ⑥	I	ENC IN2	25	GND	I	CN019 ⑤	
CN019 ④	I	DA IN1	26	GND	I	CN019 ③	
CN019 ②	I	DA IN2	27	GND	I	CN019 ①	
AUX A28	AD A28	I	AD DT1	28	GND	I	AD B28
AUX A29	AD A29	I	AD DT2	29	DI SYNC	I	AD B24
RAR A30	DEC A30	I	DEC DT1	30	GND	I	DEC B30 RAR B30
RAR A31	DEC A31	I	DEC DT2	31	EDIT	O	DEC B13 RAR B13
	DEC A32	I	BIT CK2	32	GND	I	DEC B32
	DEC A33	I	PFS	33	SL	I	DEC B33
	DEC A34	I	BT 16	34	GND	I	DEC B34
	AD A35	I	EM REC SW	35	EM ID	I	DEC B35
CN020 ⑧	O	AD OUT1	36	GND	O	CN020 ⑦	
CN020 ⑥	O	AD OUT2	37	GND	O	CN020 ⑤	
CN020 ④	O	DEC OUT1	38	GND	O	CN020 ③	
CN020 ②	O	DEC OUT2	39	GND	O	CN020 ①	
	ENC A40	O	DT EN1	40	GND	O	
	ENC A41	O	DT EN2	41	CODE REC	O	ENC B39
MT-AUX-DA AD A42	O	DT DA1	42	GND	O	AD-DA-AUX-MT B42	*14
MT-AUX-DA AD-A43	O	DT DA2	43	CODE ID	I	ENC B42 ENC B46	*15
	ENC A44	O	EM REC	44	EM PB	O	ENC B44
CN021 ④	I	MUT1	45	F WCK	I	AUX B45	
	ENC A46	I	ANA/DIG	46	INT/EXT	I	ENC B46
CN021 ⑤⑥	I	+5V	47	+5V	I	CN021 ③⑥	
CN021 ③⑥	I	+5V	48	+5V	I	CN021 ③⑥	
CN021 ②⑤	I	GND	49	GND	I	CN021 ②⑤	
CN021 ②⑤	I	GND	50	GND	I	CN021 ②⑤	

CN006
DEC

COMPONENT SIDE				SOLDERING SIDE			
DESTINATION	I/O	NAME	A/B	NAME	I/O	DESTINATION	
CN017 ③	I	GND	1	GND	I	CN017 ③	
CN017 ③	I	GND	2	GND	I	CN017 ③	
CN017 ②	I	+12V	3	+12V	I	CN017 ②	
CN017 ①	I	-12V	4	-12V	I	CN017 ①	
			5				
			6				
			7	GND	I	CN022 ③	
CN022 ④	I	V PCM IN A	7	GND	I	CN022 ①	
CN022 ②	I	V PCM IN B	8	GND	I		
			9				
	ENC B8	O	TC DELAY ON	9			
	ENC B9	I	ENC SI	10	DUB	I	ENC B12
	SIF A11	I	FLO O/E	11	GND	I	SIF B11
	SIF A12	I	VD	12	PAR	O	RAR B12
	RAR A13	I	RAR CRC	13	EDIT	I	RAR B13 SIF B31
	RAR A14	O	DEC1	14	DELAY	O	RAR B14
	RAR A15	O	DEC2	15	RAR SI	O	RAR B15
	RAR A16	O	AVE1	16	AVE2	O	RAR B16
	RAR A17	O	HOLD1	17	HOLD2	O	RAR B17
	RAR A18	O	DEC MUT	18	RAR AVE	I	RAR B18
	RAR A19	I	RAR HLD	19	RAR MUT	I	RAR B19
	SIF A20	I	CK MST	20	GND	I	SIF B20
	RAR A21	O	RAR EN	21	MUT3	I	SIF B21
	RAR A22	I	RAR BD	22	RAR B	I	RAR B22
CN016 B3	O	A/B S	23	AVE S	O	CN016 A4	
CN016 A2	O	HOLD S	24	MUTE S	O	CN016 B4	
CN016 A6	O	CRC S	25	FS S	O	CN016 A8	
DA A26	AD A26	O	BIT CK1	26	GND	O	AD B26 DA B26
AUX A27	ENC A27	O	BIT CK3	27	GND	O	ENC B27 AUX B27
	ENC A28	O	PRT	28	GND	O	ENC B28
	ENC A29	O	WE EN	29	GND	O	ENC B29
	ENC A30	SIF A30	O	DEC DT1	30	GND	O
	ENC A31	SIF A31	O	DEC DT2	31	GND	O
RAR A32	MT A32	SIF A32	O	BIT CK2	32	GND	O
	SIF A33	O	PFS	33	SL	O	SIF B33
	SIF A34	O	BT16	34	GND	O	SIF B34
		O	FS ID	35	EM ID	O	SIF B35
	DA A36	AD A36	O	WD CK1	36	GND	O
	RAR A37	MT A37	O	WD CK2	37	GND	O
	AUX A38	O	WD CK3	38	GND	O	AUX B38
CN023 ⑧	O	MUTE	39	CRC ER	O	CN023 ⑨	
CN023 ⑤	O	FS ID 0	40	FS ID1	O	CN023 ⑥	
CN023 ⑩	O	RAR ON	41	A ON	O	CN023 ⑪	
CN023 ⑫	O	B ON	42	PAR S	O	CN016 B1	
CN024 A5	I	M HOLD	43	A/B	I	CN024 B4	
CN024 B5	I	RAR	44	DUB RAW	O	DA B44 RAR B44 MT B44	
	RAR A45	I	DUB RAW S	45	F WCK	I	AUX B45
	DA A17	O	CODE MUTE	46	CODE ID	O	SIF B43 ENC B42
CN021 ③⑥	I	+5V	47	+5V	I	CN021 ③⑥	*22
CN021 ③⑥	I	+5V	48	+5V	I	CN021 ③⑥	
CN021 ②⑤	I	GND	49	GND	I	CN021 ②⑤	
CN021 ②⑤	I	GND	50	GND	I	CN021 ②⑤	

MB-11 BOARD (1/2)
BOARD NO. 1-B16-900-11 & HIGHER
PCM-1630 SERIAL NO. 10001 and higher

Note: The connector name marked with *1, 2, 3 or *4 is applicable to the units with Serial No. 11301 and higher.
The connector names marked with *5-22 are applicable to the units with Serial No. 12801 and higher.

MB-11 BOARD (2/2)
Mother BoardCN007
(RAR)

COMPONENT SIDE				SOLDERING SIDE			
DESTINATION	I/O	NAME	A/B	NAME	I/O	DESTINATION	
CN017 ③	I	GND	1	GND	I	CN017 ③	
CN017 ③	I	GND	2	GND	I	CN017 ③	
CN017 ②	I	+12V	3	+12V	I	CN017 ②	
CN017 ①	I	-12V	4	-12V	I	CN017 ①	
			5				
			6				
			7				
CN022 ②	I	V PCM IN B	8	GND	I	CN022 ①	
			9				
			10				
SIF A11	I	FLD O/E	11	GND	I		
SIF A12	I	VO	12	PAR	I	DEC B12	*2
DEC A13	O	RAR CRC	13	EDIT	I	DEC B13	*1
DEC A14	I	DEC1	14	DELAY	I	DEC B14	*3
DEC A15	I	DEC2	15	RAR ST	I	DEC B15	*4
DEC A16	I	AVE1	16	AVE2	I	DEC B16	
DEC A17	I	HOLD1	17	HOLD2	I	DEC B17	
DEC A18	I	DEC MUT	18	RAR AVE	O	DEC B18	
DEC A19	O	RAR HLD	19	RAR MUT	O	DEC B19	
SIF A20	I	CK MST	20	GND	I	SIF B20	
DEC A21	I	RAR EN	21	MUT3	I	SIF B21	
DEC A22	O	RAR BD	22	RAR B	O	DEC B22	
			23				
			24				
			25				
AUX A25	MT A29	DA A27	O	RAW DT1	27	GND	O DA B27 MT B29 AUX B25
AUX A26	MT A30	DA A28	O	RAW DT2	28	GND	O DA B28 MT B30 AUX B26
ENC A30	SIF A30	O	DEC DT1	30	GND	O	SIF B30 ENC B30
ENC A31	SIF A31	O	DEC DT2	31	GND	O	
DEC A32	I	BIT CK2	32	GND	I	DEC B32	
			33				
			34				
			35	EM ID R	O		
			36				
DEC A37	I	WD CK2	37	GND	I	DEC B37	
			38				
			39	MUTE R	O		
			40	AVE R	O		
			41				
			42				
			43				
MT B44	DA B44	O	DUB/EDT	44	DUB RAW	I	DEC B44
DEC A45	O	DUB RAW S	45	F WDCK	I	AUX B45	
			46				
DEC A47-48,B47-48	I	+5V	47	+5V	I	DEC A47-48,B47-48	
DEC A47-48,B47-48	I	+5V	48	+5V	I	DEC A47-48,B47-48	
DEC A49-50,B49-50	I	GND	49	GND	I	DEC A49-50,B49-50	
DEC A49-50,B49-50	I	GND	50	GND	I	DEC A49-50,B49-50	

CN008
MT

COMPONENT SIDE				SOLDERING SIDE			
DESTINATION	I/O	NAME	A/B	NAME	I/O	DESTINATION	
			1				
			2				
			3				
			4				
CN023 ⑤⑥	O	MA1	5	MA1	O	CN023 ⑤⑥	
CN023 ⑦⑧	O	MA2	6	MA2	O	CN023 ⑦⑧	
CN023 ⑨⑩	O	MA3	7	MA3	O	CN023 ⑨⑩	
CN023 ⑪⑫	O	MA4	8	MA4	O	CN023 ⑪⑫	
CN023 ⑬	O	MD0	9	MD1	O	CN023 ⑬	
ENC A10	I	DT ME1	10	GND	I	ENC B10	
ENC A11	I	DT ME2	11	GND	I	ENC B11	
CN023 ⑮	O	MD2	12	MD3	O	CN023 ⑮	
CN023 ⑯	O	MD4	13	MD5	O	CN023 ⑯	
CN023 ⑰	O	MD6	14	MD7	O	CN023 ⑰	
CN023 ⑱	O	MD8	15	MD9	O	CN023 ⑱	
CN023 ⑲	O	MD10	16	MD11	O	CN023 ⑲	
CN023 ⑳	O	MD12	17	MD13	O	CN023 ⑳	
CN023 ㉑	O	MD14	18	MD15	O	CN023 ㉑	
CN023 ㉒	I	HR1	19	HR2	I	CN023 ㉒	
CN023 ㉓	I	HR3	20	HR4	I	CN023 ㉓	
CN023 ㉔	I	HR5	21	HR6	I	CN023 ㉔	
CN023 ㉕	I	SCALE	22	PEAK	I	CN023 ㉕	
			23				
CN016 B6	O	R WDCK(+)	24	R WDCK(-)	O	CN016 B5	
CN016 B7	O	R BIT CK(+)	25	R BIT CK(-)	O	CN016 B8	
CN016 A9	O	R DT1(+)	26	R DT1(-)	O	CN016 B9	
CN016 A10	O	R DT2(+)	27	R DT2(-)	O	CN016 B10	
			28				
RAR A27	I	RAW DT1	29	GND	I	RAR B27	
RAR A28	I	RAW DT2	30	GND	I	RAR B28	
			31				
DEC A32	I	BIT CK2	32	GND	I	DEC B32	
			33				
ENC A34	I	EM PB SW	34	EM ENC	I	ENC B34	
			35				
			36				
DEC A37	I	WD CK2	37	GND	I	DEC B37	
			38				
CN024 B2	CN016 A1	I	REC/PB SW	39			
DA A41	O	REC/PB	40				
			41				
SIF A42	I	DT DA1	42	GND	I	SIF B42	
SIF A43	I	DT DA2	43	GND	I		
			44	DUB/EDT	I	RAR A44	
			45	F WDCK	I	AUX B45	
CN021 ①	I	+5V M	46	+5V M	I	CN021 ①	
RAR A47-48,B47-48	CN023 ⑦⑧	I	+5V	47	+5V	I	RAR A47-48,B47-48 CN023 ⑦⑧
RAR A47-48,B47-48	CN023 ⑨⑩	I	+5V	48	+5V	I	RAR A47-48,B47-48 CN023 ⑨⑩
RAR A49-50,B49-50	CN023 ⑪⑫	I	GND	49	GND	I	RAR A49-50,B49-50 CN023 ⑪⑫
RAR A49-50,B49-50	CN023 ⑬	I	GND	50	GND	I	RAR A49-50,B49-50 CN023 ⑬

CN010

No.	NAME	DESTINATION
1	-8V	CN001 A6-B6
2	-8V(G)	CN001 A5-B5
3	-22V	CN001 A4-B4
4	+22V	CN001 A3-B3
5	+22V(G)	CN001 A1-2,B1-2

CN011

No.	NAME	DESTINATION
1	A OUT1(G)	CN002 A10-B10
2	A OUT1(-)	CN002 A9-B9
3	A OUT1(+)	CN002 A8-B8
4	A IN1(G)	CN001 A10-B10
5	A IN1(-)	CN001 A9-B9
6	A IN1(+)	CN001 A8-B8

CN012

No.	NAME	DESTINATION
1	A OUT2(G)	CN002 A40-B40
2	A OUT2(-)	CN002 A39-B39
3	A OUT2(+)	CN002 A38-B38
4	A IN2(G)	CN001 A40-B40
5	A IN2(-)	CN001 A39-B39
6	A IN2(+)	CN001 A38-B38

CN013

No.	NAME	DESTINATION
1	MON2(G)	CN002 B30
2	MON2	CN002 A30
3	LVL2(G)	CN002 B30
4	LVL IN2	CN002 B31
5	LVL OUT2	CN002 A31
6	LVL1(G)	CN002 B13
7	LVL IN1	CN002 B14
8	LVL OUT1	CN002 A14
9	MON1(G)	CN002 B13
10	MON1	CN002 A13

CN014

No.	NAME	DESTINATION
1		
2		
3	GND	CN005 A5-B5
4	V PCM OUT4	CN005 B7
5	GND	CN005 A5-B5
6	V PCM OUT3	CN005 A7
7	GND	CN005 A5-B5
8	V PCM OUT2	CN005 B6
9	GND	CN005 A5-B5
10	V PCM OUT1	CN005 A6

CN015

No.	NAME	DESTINATION
1	GND	CN005 B16
2	W SYNC OUT	CN005 A16
3	GND	CN005 B15
4	W SYNC IN	CN005 A15

CN017

No.	NAME	DESTINATION
1	-12V	CN005-6 A4-B4
2	+12V	CN005-6 A3-B3
3	+12V(G)	CN005-6 A1-2,B1-2

CN018

No.	NAME	DESTINATION
1	GND	CN005 B10
2	C SYNC IN	CN005 A10
3	GND	CN005 B8
4	C SYNC OT2	CN005 A9
5	GND	CN005 B8
6	C SYNC OT1	CN005 A8

CN019

No.	NAME	DESTINATION
1	GND	CN005 B27
2	DA IN2	CN005 A27
3	GND	CN005 B26
4	DA IN1	CN005 A26
5	GND	CN005 B25
6	ENC IN2	CN005 A25
7	GND	CN005 B24
8	ENC IN1	CN005 A24

CN020

No.	NAME	DESTINATION
1	GND	CN005 B39
2	DEC OUT2	CN005 A39
3	GND	CN005 B38
4	DEC OUT1	CN005 A38
5	GND	CN005 B37
6	AD OUT2	CN005 A37
7	GND	CN005 B36
8	AD OUT1	CN005 A36

CN021

No.	NAME	DESTINATION
1	+5V-MT	CN008 A46-B46
2	+5V(G)	CN005-6 A49-50,B49-50
3	+5V	CN005-6 A47-48,B47-48
4	MUT1	CN005 A45
5	+5V(G)	CN005-6 A49-50,B49-50
6	+5V	CN005-6 A47-48,B47-48

CN022

No.	NAME	DESTINATION
1	GND	CN006 B8
2	V PCM INB	CN006 A8
3	GND	CN006 B7
4	V PCM INA	CN006 A7

DESTINATION
CN008 A39
CN006 A24
CN006 A49
CN006 B23
CN006 A49
CN006 A25
CN006 A49
CN006 B25
CN008 A26
CN008 A27

DESTINATION
CN005 A17
CN005 A18
CN006 A40
CN004 A36
CN006 B39
CN006 B41
CN004 A37
CN008 A5
CN008 A6
CN008 A7
CN008 A8
CN008 A9
CN008 A12
CN008 A13
CN008 A14
CN008 A15
CN008 A16
CN008 A17
CN008 A18
CN008 A19
CN008 A20
CN008 A21
CN008 A22
CN008 A47-B47
CN008 A49-B49

DESTINATION
CN004 A43
CN004 A45
CN008 B49
CN004 B45
CN006 A43

Note: The connector name marked with *1 is applicable to the units with Serial No.11301 and higher.
The connector names marked with *2,3 and 4 are applicable to the units with Serial No.12801 and higher.

INATION
•6 A4•B4
•6 A3•B3
A1•2,B1•2

INATION
•5 B10
•5 A10
•5 B8
•5 A9
•5 B8
•5 A8

TINATION
5 B27
5 A27
5 B26
5 A26
5 B25
5 A25
5 B24
5 A24

TINATION
5 B39
5 A39
5 B38
5 A38
5 B37
5 A37
5 B36
5 A36

INATION
•1 A46•B46
•49•50,B49•50
•47•48,B47•48
•05 A45
•49•50,B49•50
•47•48,B47•48

INATION
•06 B8
•06 A8
•06 B7
•06 A7

CN016

DESTINATION	NAME	A	B	NAME	DESTINATION
CN008 A39	REC/PB	1	1	PAR	CN006 B42
CN006 A24	HLD	2	2	EMP	CN004 A33
CN006 A49	GND	3	3	A/B	CN006 A23
CN006 B23	AVE	4	4	MUTE	CN006 B24
CN006 A49	GND	5	5	W CLK	CN008 B24
CN006 A25	CRC	6	6	W CLK	CN008 A24
CN006 A49	GND	7	7	B CLK	CN008 A25
CN006 B25	FS ID	8	8	B CLK	CN008 B25
CN008 A26	ME CH-1	9	9	ME CH-1	CN008 B26
CN008 A27	ME CH-2	10	10	ME CH-2	CN008 B27

CN023

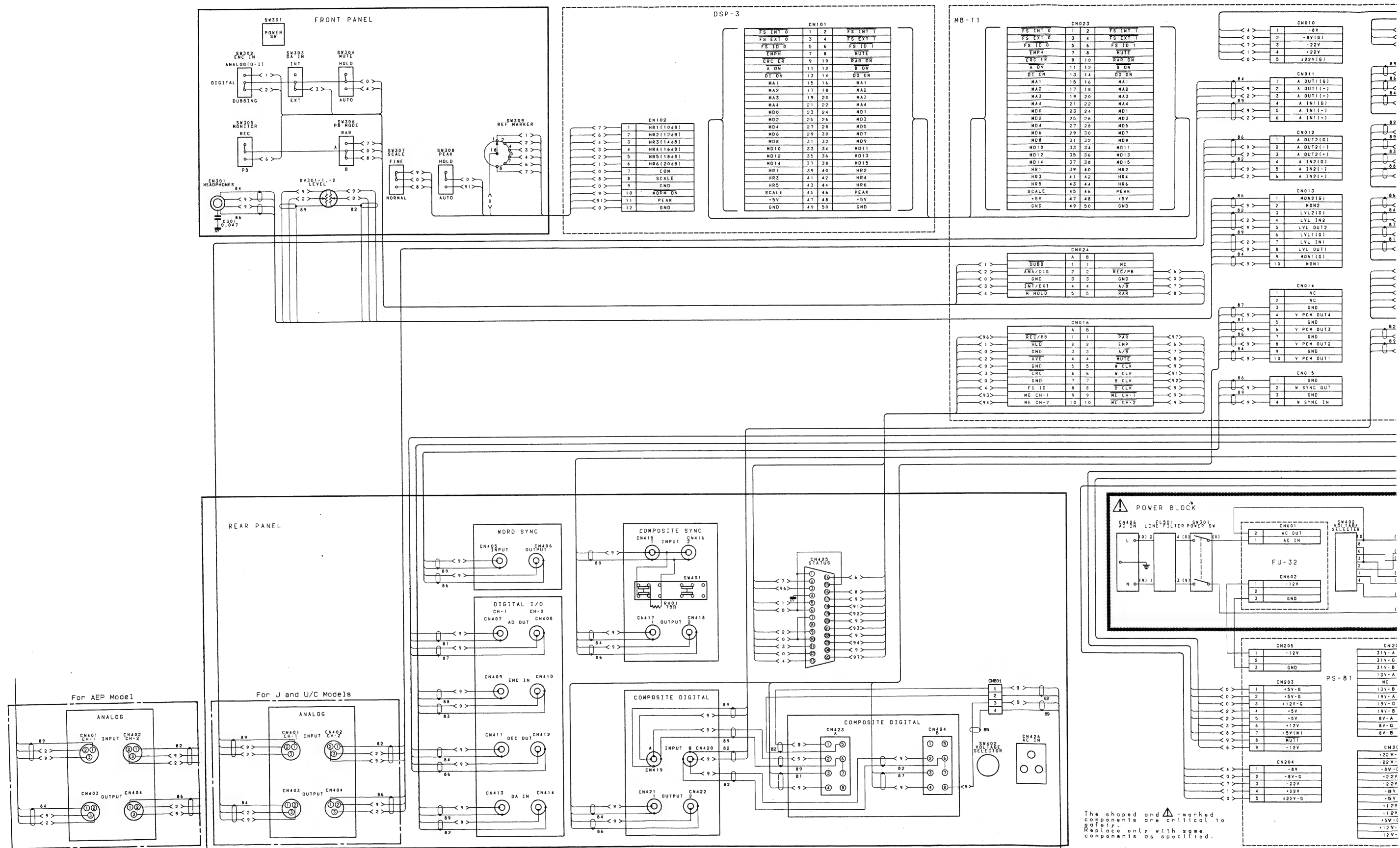
DESTINATION	NAME	No.	NAME	DESTINATION
CN005 A17	FS INT 0	1	FS INT 1	CN005 B17
CN005 A18	FS EXT 0	3	FS EXT 1	CN005 B18
CN006 A40	FS ID 0	5	FS ID 1	CN006 B40
CN004 A36	EMPH	7	MUTE	CN006 A39
CN006 B39	CRC ER	9	RAR ON	CN006 A41
CN006 B41	A ON	11	B ON	CN006 A42
CN004 A37	DI ON	13	DO ON	CN004 B37
CN008 A5	MA1	15	MA1	CN008 B5
CN008 A6	MA2	17	MA2	CN008 B6
CN008 A7	MA3	19	MA3	CN008 B7
CN008 A8	MA4	21	MA4	CN008 B8
CN008 A9	MD0	23	MD1	CN008 B9
CN008 A12	MD2	25	MD3	CN008 B12
CN008 A13	ND4	27	ND5	CN008 B13
CN008 A14	MD6	29	MD7	CN008 B14
CN008 A15	MD8	31	MD9	CN008 B15
CN008 A16	MD10	33	MD11	CN008 B16
CN008 A17	MD12	35	MD13	CN008 B17
CN008 A18	MD14	37	MD15	CN008 B18
CN008 A19	HR1	39	HR2	CN008 B19
CN008 A20	HR3	41	HR4	CN008 B20
CN008 A21	HR5	43	HR6	CN008 B21
CN008 A22	SCALE	45	PEAK	CN008 B22
CN008 A47•B47	+5V	47	+5V	CN008 A47•B47
CN008 A49•B49	GND	49	GND	CN008 A49•B49

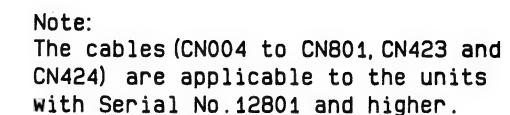
CN024

DESTINATION	NAME	A	B	NAME	DESTINATION
CN004 A43	DUBB	1	1	—	CN007 A44
CN004 A45	ANA/DIG	2	2	REC/PB	CN008 A39
CN008 B49	GND	3	3	GND	CN008 B49
CN004 B45	INT/EXT	4	4	A/B	CN006 B43
CN006 A43	M HOLD	5	5	RAR	CN006 A44

MB-11BOARD (2/2)
BOARD NO.1-616-300-11 & HIGHER
PCM-1630 SERIAL NO.10001 and higher

FRAME WIRING





SECTION D
REPLACEABLE PARTS


PARTS ORDERING INFORMATION

Standardization of Parts
Repair parts supplied from Sony Parts Center may not be always identical with the part which actually in use due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts". This manual's exploded views and electrical parts list are indicating the parts numbers of the "standardized genuine parts at present".

Parts marked with S in the column of SP
These parts are normally stocked as replaceable parts.

Parts marked with O in the column of SP
Orders for these parts will be processed, but allow for additional delivery time.

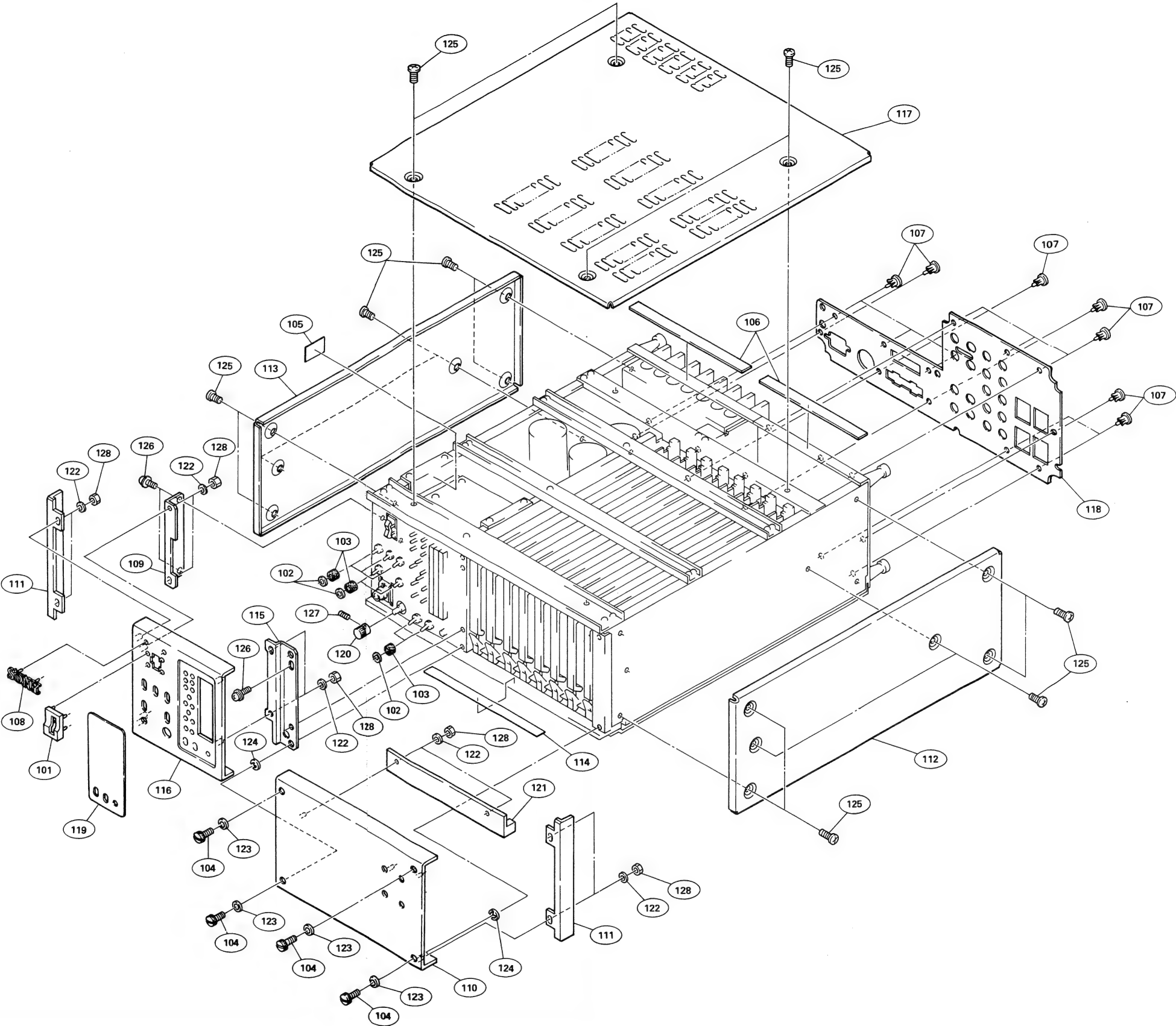
Parts without Part No.
These parts are not stocked because they are seldom required for routine service.

The components marked with  are critical to safe operation. These components must be replaced with the same ones as described on the Parts List.

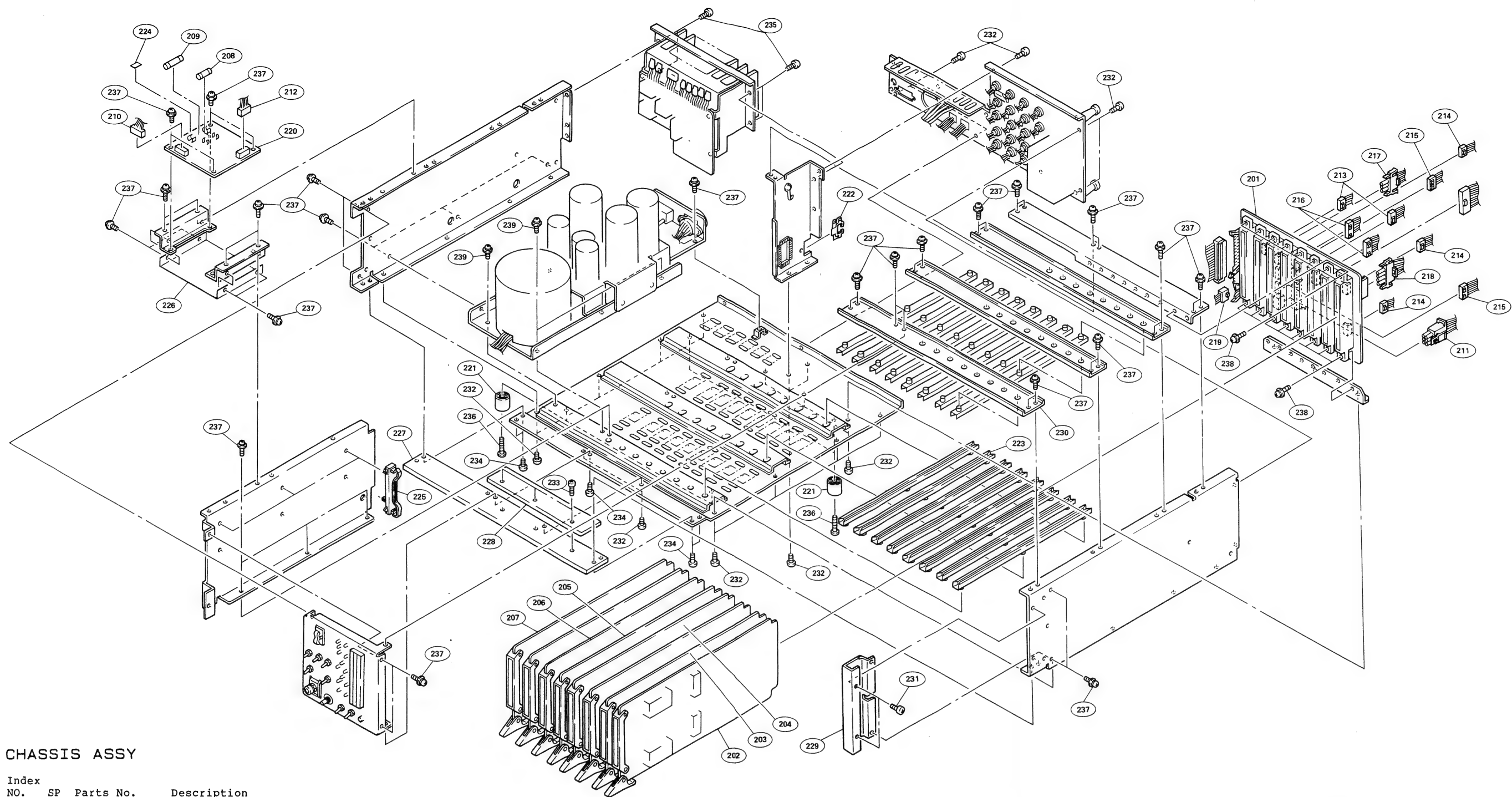
D-1 EXPLODED VIEWS AND PARTS LIST

OVERALL ASSY

Index NO.	SP	Parts No.	Description
101	O	2-251-642-00	GUARD, POWER SWITCH
102	S	2-300-629-00	PLATE, BLIND
103	S	2-300-636-00	CUSHION
104	S	3-621-050-11	SCREW, COVER
105	O	3-703-044-26	LABEL, CAUTION
106	S	3-831-441-XX	FELT, PANEL
107	S	4-812-134-11	RIVET, NYLON, 3.5
108	O	4-840-002-00	EMBLEM, SONY
109	O	4-874-186-01	BRACKET (LEFT), METER PANEL
110	O	4-874-198-01	PANEL, FRONT
111	O	4-874-199-01	ESCUTCHEON, SIDE
112	O	4-911-701-01	PANEL (RIGHT), SIDE
113	O	4-911-702-01	PANEL (LEFT), SIDE
114	O	4-911-705-01	LABEL, PC BOARD POSITION
115	O	4-911-707-01	BRACKET (RIGHT), METER PANEL
116	O	4-911-716-01	PANEL, METER
117	O	4-911-719-01	PANEL, TOP
118	O	4-911-729-01	PLATE, ORNAMENTAL, REAR
119	S	4-911-739-01	SEAT, METER
120	S	4-911-740-01	KNOB, HEADPHONES (A)
121	O	4-911-744-01	CLAMP, PC BOARD
122	S	7-623-208-22	SPRING WASHER, M3
123	S	7-623-925-01	WASHER, NYLON, M4
124	S	7-624-106-04	STOP RING 3
125	S	7-682-560-09	SCREW, +B4x6
126	S	7-682-947-01	SCREW, +PSW3x6
127	S	7-683-237-01	SET SCREW, 3x3
128	S	7-684-023-04	NUT, M3



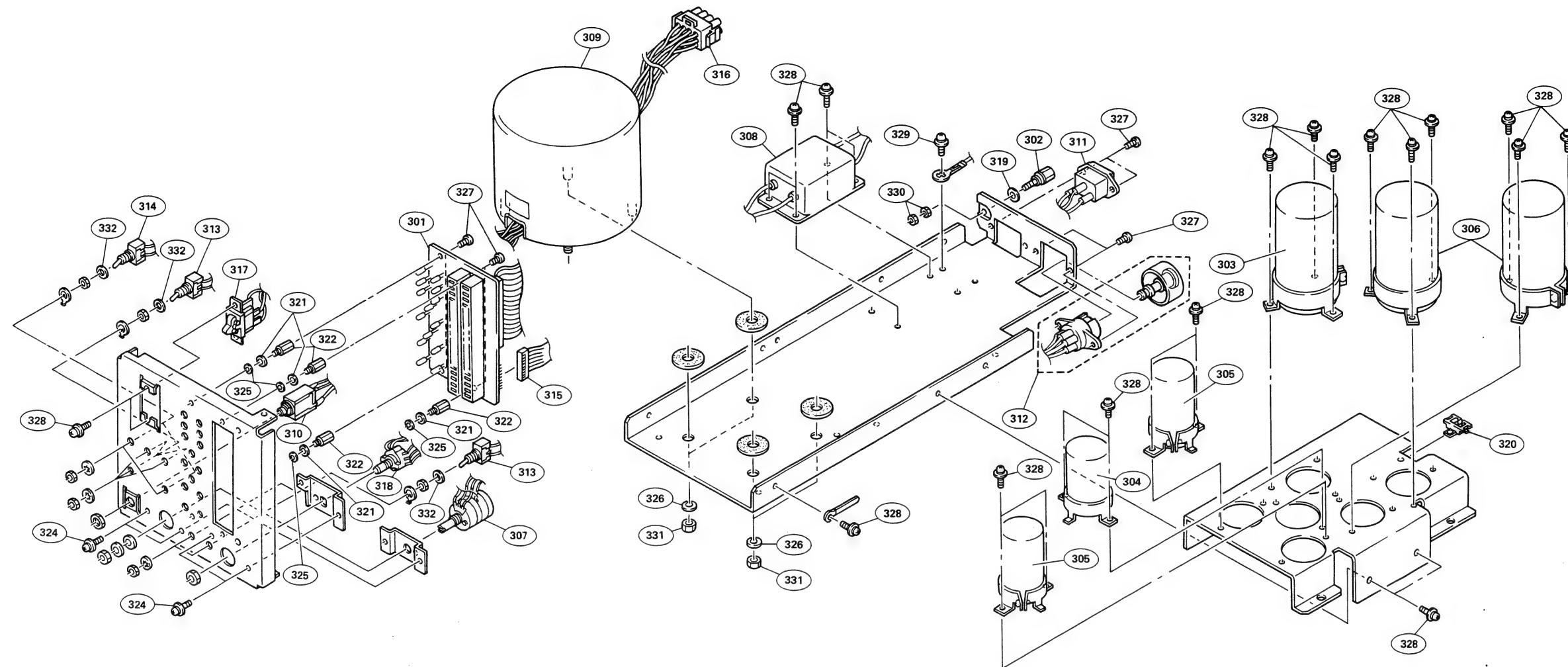
CHASSIS ASSY CHASSIS ASSY



CHASSIS ASSY

Index NO.	SP	Parts No.	Description
201	O	A-7850-287-A	COMPLETE PCB,MB-11
202	O	A-7850-291-A	COMPLETE PCB,AD-23
203	O	A-7850-293-A	COMPLETE PCB,DA-15
204	O	A-7850-295-A	COMPLETE PCB,ENC-2
205	O	A-7850-297-A	COMPLETE PCB,SIF-1
206	O	A-7850-299-A	COMPLETE PCB,DEC-15
207	O	A-7850-301-A	COMPLETE PCB,MT-16
208	S	1-532-237-00	FUSE,TIME-LAG 3.15A (For AE Model)
209	S	1-532-713-00	FUSE,TIME-LAG 3A (For J and UC Models)
210	O	1-561-069-00	PLUG,HOUSING,2P (For CN601,FU-32 Board)
	O	1-535-206-00	CONTACT,FEMALE

211	O	1-561-071-00	PLUG,HOUSING,3P	217	O	1-561-828-00	PLUG,HOUSING,3P	226	O	4-874-191-01	PLATE,SHIELD,FU-32
	O	1-561-067-00	CONTACT,FEMALE		O	1-561-067-00	CONTACT,FEMALE	227	O	4-874-194-01	STAY,LOWER
212	O	1-561-515-00	PLUG,HOUSING,3P	218	O	1-561-863-00	PLUG,HOUSING,5P	228	O	4-874-195-01	STOPPER
	O	1-560-372-00	CONTACT,FEMALE		O	1-561-067-00	CONTACT,FEMALE	229	O	4-911-706-01	BRACKET,FRONT PANEL
213	O	1-561-516-00	PLUG,HOUSING,4P	219	O	1-561-888-00	PLUG,HOUSING,10P	230	O	4-911-721-01	STAY,UPPER
	O	1-560-372-00	CONTACT,FEMALE		O	1-560-768-00	CONTACT,FEMALE	231	S	7-682-546-04	SCREW,+B3x5
214	O	1-561-518-00	PLUG,HOUSING,6P	220	O	1-616-451-11	PC BOARD,FU-32	232	S	7-682-546-09	SCREW,+B3x5
	O	1-560-372-00	CONTACT,FEMALE	221	S	3-642-656-01	FOOT	233	S	7-682-549-04	SCREW,+B3x10
215	O	1-561-519-00	PLUG,HOUSING,8P	222	O	3-646-071-00	HOLDER,WIRE	234	S	7-682-548-09	SCREW,+B3x8
	O	1-560-372-00	CONTACT,FEMALE	223	O	3-673-676-41	RAIL,GUIDE,PC BOARD	235	S	7-682-560-09	SCREW,+B4x6
216	O	1-561-520-00	PLUG,HOUSING,10P	224	S	3-701-948-19	LABEL,FUSE (For AE Model Only)	236	S	7-682-566-09	SCREW,+B4x20
	O	1-560-372-00	CONTACT,FEMALE	225	O	4-874-187-01	CLIP,CABLE	237	S	7-682-947-01	SCREW,+PSW3x6
								238	S	7-682-950-01	SCREW,+PSW3x12
								239	S	7-682-961-01	SCREW,+PSW4x8

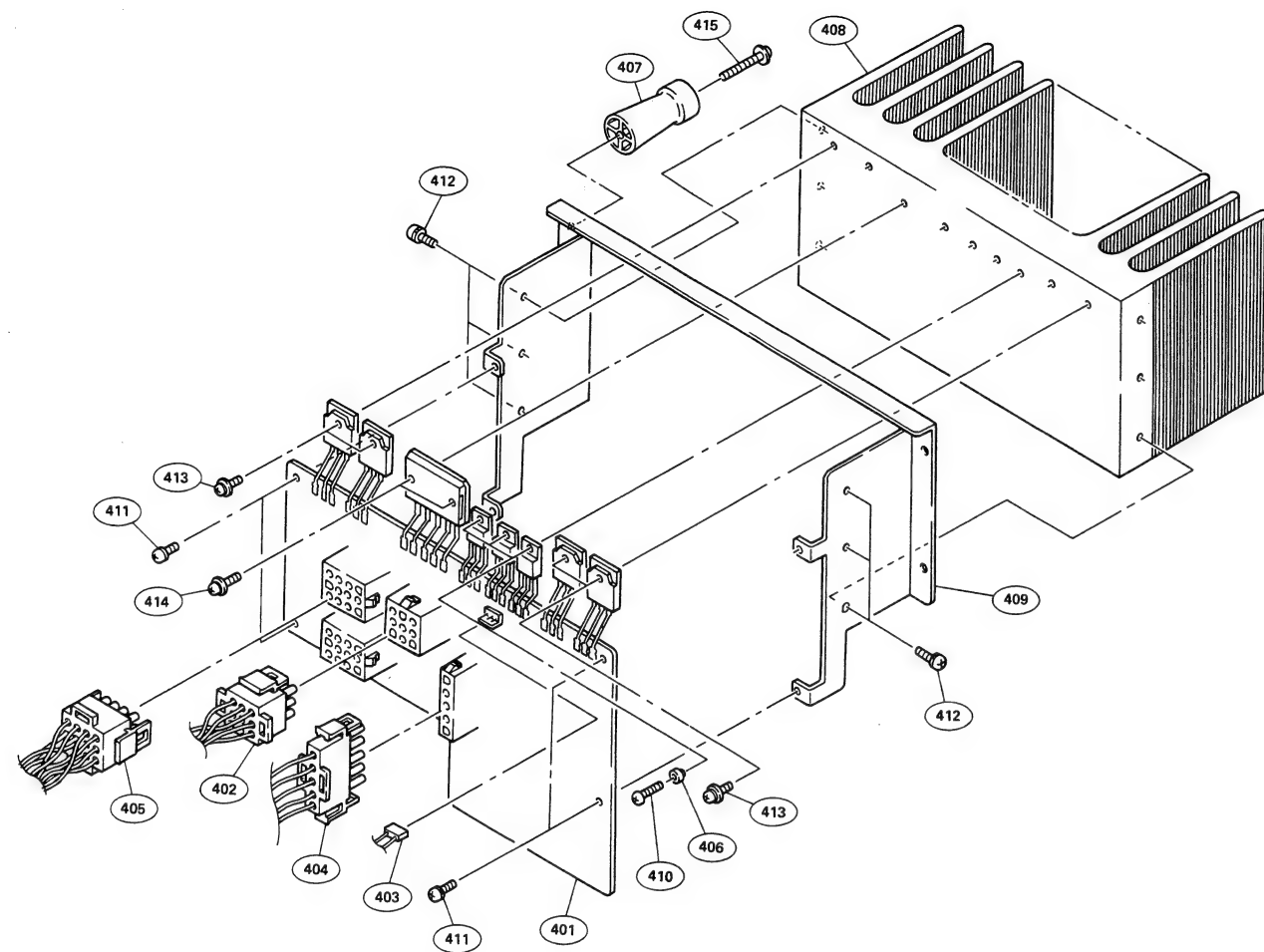


POWER & METER ASSY

Index NO.	SP	Parts No.	Description
301	O	A-7850-289-A	COMPLETE PCB,DSP-3
302	O	X-4801-204-0	TERMINAL ASSY
303	S	1-125-406-00	CAP,ELECT 56000 20% 16V
304	S	1-125-407-00	CAP,ELECT 12000 20% 25V
305	S	1-125-408-00	CAP,ELECT 10000 20% 35V
306	S	1-125-409-00	CAP,ELECT 22000 20% 50V
307	S	1-230-880-11	RES,VAR,CARBON 10K/10K RV24
308	S	1-421-518-00	FILTER,NOISE
309	S	1-448-295-11	TRANSFORMER POWER
310	S	1-507-507-00	JACK
311	S	1-509-547-00	3P INLET
312	S	1-526-572-00	SOCKET,POWER VOLTAGE SELECT
313	S	1-553-244-00	SWITCH,TOGGLE
314	S	1-553-247-00	SWITCH,TOGGLE
315	O	1-561-521-00	PLUG,HOUSING,12P
	O	1-560-372-00	CONTACT,FEMALE

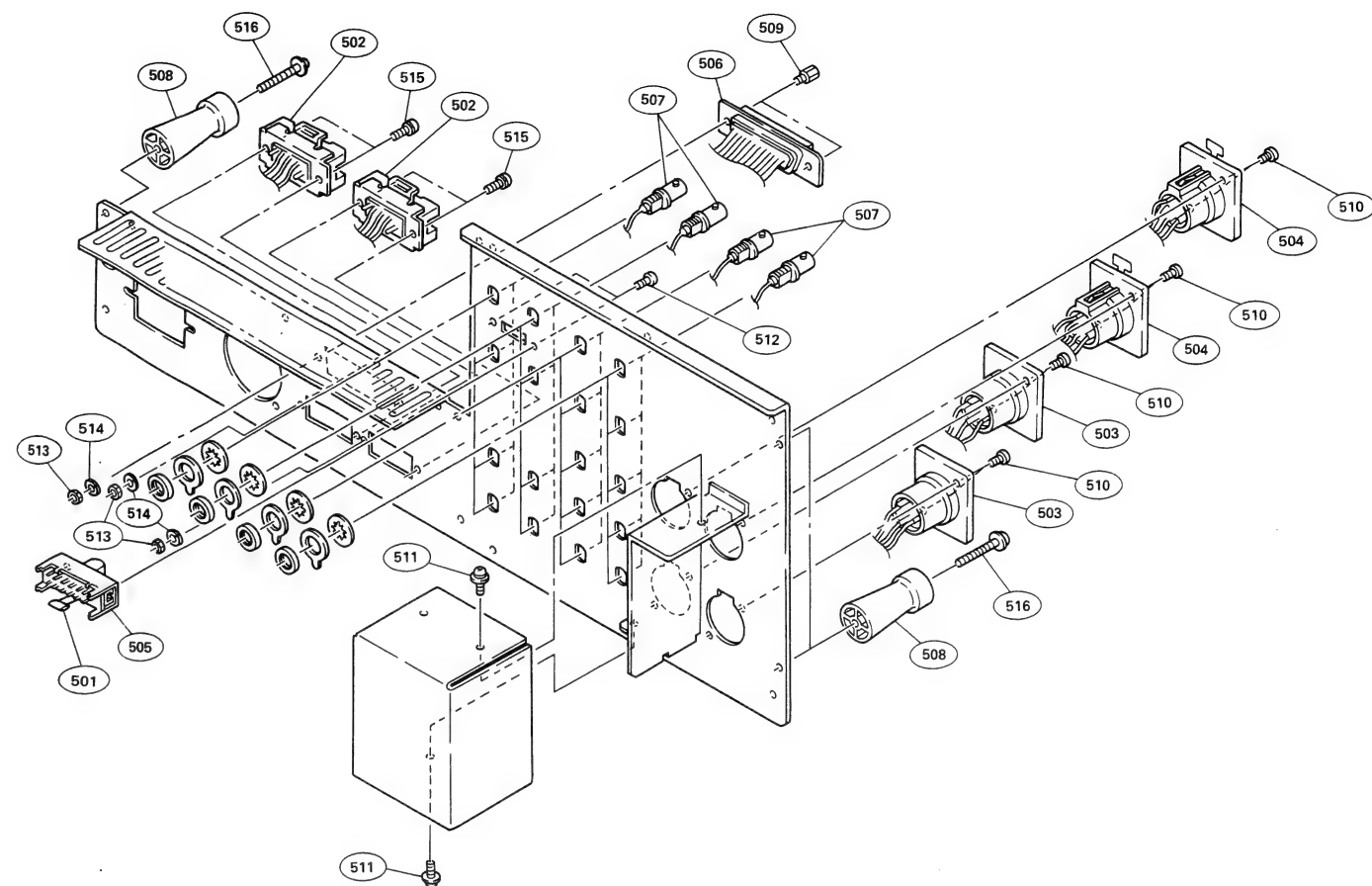
316	O	1-562-849-11	PLUG,HOUSING,12P
	O	1-535-206-00	CONTACT,FEMALE
317	S	1-570-117-11	SWITCH,SEESAW(AC POWER)
318	S	1-570-297-11	SWITCH,ROTARY
319	O	2-376-536-00	SPACER,STOPPER
320	O	3-646-071-00	HOLDER,WIRE
321	S	3-845-490-00	WASHER
322	O	3-880-616-00	BOSS
324	S	7-621-759-35	SCREW,+PSW2.6x5
325	S	7-623-208-22	SPRING WASHER,M3
326	S	7-623-213-22	SPRING WASHER,M6
327	S	7-682-547-09	SCREW,+B3x6
328	S	7-682-947-01	SCREW,+PSW3x6
329	S	7-682-961-01	SCREW,+PSW4x8
330	S	7-684-023-04	NUT,M3
331	S	7-684-026-04	NUT,M6
332	S	7-688-006-01	WASHER,M6,SMALL

HEAT SINK ASSY REAR PANEL ASSY



HEAT SINK ASSY

Index NO.	SP	Parts No.	Description
401	O	A-7804-024-A	COMPLETE PCB,PS-81
402	O	1-561-072-00	PLUG,HOUSING,3P
	O	1-561-067-00	CONTACT,FEMALE
403	O	1-561-515-00	PLUG,HOUSING,3P
	O	1-560-372-00	CONTACT,FEMALE
404	O	1-561-863-00	PLUG,HOUSING,5P
	O	1-561-067-00	CONTACT,FEMALE
405	O	1-562-849-21	PLUG,HOUSING,12P
	O	1-561-067-00	CONTACT,FEMALE
406	S	2-832-007-00	BUSHING(K),INSULATING
407	S	3-668-924-00	FOOT,REAR
408	O	4-874-193-01	HEAT SINK
409	O	4-911-718-01	BRACKET,HEAT SINK
410	S	7-621-775-40	SCREW,+B2.6x8
411	S	7-682-547-09	SCREW,+B3x6
412	S	7-682-661-01	SCREW,+PS4x8
413	S	7-682-949-01	SCREW,+PSW3x10
414	S	7-682-950-01	SCREW,+PSW3x12
415	S	7-682-970-01	SCREW,+PSW4x40



REAR PANEL ASSY

Index NO.	SP	Parts No.	Description
501	S	1-214-105-00	RES,METAL FILM 75 1% 1/4W
502	S	1-509-095-00	8P MULTI SOCKET
503	S	1-509-176-31	RECEPTACLE,MALE,XLR3P
504	S	1-509-184-31	RECEPTACLE,FEMALE,XLR3P
505	S	1-514-580-00	SWITCH,SLIDE
506	S	1-558-096-11	CORD(WITH D SUB CONNECTOR)
507	O	1-562-261-00	RECEPTACLE,BNC
508	S	3-668-924-00	FOOT,REAR
509	O	3-673-910-00	SCREW,CONNECTOR
510	S	7-621-259-42	SCREW,+P2.6x6
511	S	7-621-759-35	SCREW,+PSW2.6x5
512	S	7-621-775-10	SCREW,+B2.6x4
513	S	7-622-207-05	NUT,M2.6
514	S	7-623-207-22	SPRING WASHER,M2.6
515	S	7-628-254-45	SCREW,+PS2.6x12
516	S	7-682-970-01	SCREW,+PSW4x40

D-2. ELECTRICAL PARTS LIST

Ref.No. or Qty SP	Part No.	Description	Ref.No. or Qty SP	Part No.	Description
AD-23 BOARD					
1pc	O	A-7850-291-A COMPLETE PCB,AD-23 (This assembly includes the following parts.)	C46	S	1-101-004-00 CAP,CERAMIC 0.01 50V
1pc	S	2-251-622-00 LEVER,PC BOARD	C47	S	1-101-004-00 CAP,CERAMIC 0.01 50V
1pc	O	3-673-867-00 PLATE,INDICATION,PC BOARD	C48	S	1-101-004-00 CAP,CERAMIC 0.01 50V
2pcs	O	4-874-188-01 SHIELD,AD CONVERTER	C49	S	1-101-004-00 CAP,CERAMIC 0.01 50V
2pcs	O	4-874-192-01 HEAT SINK	C50	S	1-101-004-00 CAP,CERAMIC 0.01 50V
1pc	O	4-911-704-51 LABEL(AD),PC BOARD	C55	S	1-131-450-00 CAP,TANT 1 20% 50V
1pc	O	4-911-722-01 CASE(UPPER),SHIELD,AD	C56	S	1-131-450-00 CAP,TANT 1 20% 50V
1pc	O	4-911-723-01 CASE(LOWER),SHIELD,AD	C57	S	1-131-450-00 CAP,TANT 1 20% 50V
2pcs	O	4-911-749-01 SHEET, AD	C58	S	1-131-449-11 CAP,TANT 3.3 20% 16V
2pcs	S	7-626-317-21 PIN,SPRING 2.5x8	C59	S	1-131-449-11 CAP,TANT 3.3 20% 16V
3pcs	S	7-682-547-04 SCREW,+B3x6	C60	S	1-124-721-41 CAP,ELECT 10 20% 50V
3pcs	S	7-684-023-04 NUT,M3	C61	S	1-161-894-00 CAP,CERAMIC 0.1 50V
AFL101	S	8-830-503-01 H-IC BH-106	C62	S	1-101-004-00 CAP,CERAMIC 0.01 50V
AFL201	S	8-830-503-01 H-IC BH-106	C63	S	1-101-004-00 CAP,CERAMIC 0.01 50V
C1	S	1-124-725-41 CAP,ELECT 100 20% 50V	C101	S	1-130-479-00 CAP,MYLAR 0.0047 5% 50V
C2	S	1-161-894-00 CAP,CERAMIC 0.1 50V	C102	S	1-131-449-11 CAP,TANT 3.3 20% 16V
C3	S	1-161-894-00 CAP,CERAMIC 0.1 50V	C103	S	1-161-894-00 CAP,CERAMIC 0.1 50V
C4	S	1-124-725-41 CAP,ELECT 100 20% 50V	C104	S	1-162-176-00 CAP,CERAMIC 1.5 25V
C5	S	1-131-450-00 CAP,TANT 1 20% 50V	C105	S	1-162-176-00 CAP,CERAMIC 1.5 25V
C6	S	1-124-724-41 CAP,ELECT 47 20% 50V	C106	S	1-104-239-00 CAP,STYROL 1500P 5% 125V
C7	S	1-124-725-41 CAP,ELECT 100 20% 50V	C107	S	1-161-461-00 CAP,CERAMIC 150P 5% 50V
C8	S	1-161-894-00 CAP,CERAMIC 0.1 50V	C108	S	1-131-449-11 CAP,TANT 3.3 20% 16V
C9	S	1-161-894-00 CAP,CERAMIC 0.1 50V	C109	S	1-136-141-00 CAP,MYLAR 0.001 5% 50V
C10	S	1-124-725-41 CAP,ELECT 100 20% 50V	C110	S	1-136-141-00 CAP,MYLAR 0.001 5% 50V
C11	S	1-131-450-00 CAP,TANT 1 20% 50V	C111	S	1-136-141-00 CAP,MYLAR 0.001 5% 50V
C12	S	1-124-724-41 CAP,ELECT 47 20% 50V	C113	S	1-131-449-11 CAP,TANT 3.3 20% 16V
C13	S	1-131-450-00 CAP,TANT 1 20% 50V	C114	S	1-131-450-00 CAP,TANT 1 20% 50V
C14	S	1-124-724-41 CAP,ELECT 47 20% 50V	C115	S	1-131-450-00 CAP,TANT 1 20% 50V
C15	S	1-131-450-00 CAP,TANT 1 20% 50V	C116	S	1-161-894-00 CAP,CERAMIC 0.1 50V
C16	S	1-124-724-41 CAP,ELECT 47 20% 50V	C117	S	1-124-721-41 CAP,ELECT 10 20% 50V
C17	S	1-161-894-00 CAP,CERAMIC 0.1 50V	C118	S	1-131-450-00 CAP,TANT 1 20% 50V
C18	S	1-161-894-00 CAP,CERAMIC 0.1 50V	C119	S	1-131-450-00 CAP,TANT 1 20% 50V
C19	S	1-161-894-00 CAP,CERAMIC 0.1 50V	C120	S	1-131-450-00 CAP,TANT 1 20% 50V
C20	S	1-161-894-00 CAP,CERAMIC 0.1 50V	C121	S	1-131-450-00 CAP,TANT 1 20% 50V
C21	S	1-124-478-11 CAP,ELECT 100 20% 25V	C123	S	1-162-176-00 CAP,CERAMIC 1.5 25V
C22	S	1-161-894-00 CAP,CERAMIC 0.1 50V	C124	S	1-131-450-00 CAP,TANT 1 20% 50V
C23	S	1-124-478-11 CAP,ELECT 100 20% 25V	C125	S	1-131-450-00 CAP,TANT 1 20% 50V
C24	S	1-161-894-00 CAP,CERAMIC 0.1 50V	C126	S	1-131-450-00 CAP,TANT 1 20% 50V
C25	S	1-124-478-11 CAP,ELECT 100 20% 25V	C127	S	1-161-894-00 CAP,CERAMIC 0.1 50V
C26	S	1-124-478-11 CAP,ELECT 100 20% 25V	C128	S	1-124-721-41 CAP,ELECT 10 20% 50V
C27	S	1-101-004-00 CAP,CERAMIC 0.01 50V	C129	S	1-131-450-00 CAP,TANT 1 20% 50V
C28	S	1-124-478-11 CAP,ELECT 100 20% 25V	C130	S	1-131-450-00 CAP,TANT 1 20% 50V
C29	S	1-101-004-00 CAP,CERAMIC 0.01 50V	C131	S	1-131-450-00 CAP,TANT 1 20% 50V
C30	S	1-161-894-00 CAP,CERAMIC 0.1 50V	C132	S	1-131-450-00 CAP,TANT 1 20% 50V
C31	S	1-102-510-00 CAP,CERAMIC 12P 5% 50V	C133	S	1-131-450-00 CAP,TANT 1 20% 50V
C32	S	1-161-894-00 CAP,CERAMIC 0.1 50V	C134	S	1-131-449-11 CAP,TANT 3.3 20% 16V
C33	S	1-102-953-00 CAP,CERAMIC 18P 5% 50V	C135	S	1-124-697-41 CAP,ELECT 47 20% 25V
C34	S	1-131-449-11 CAP,TANT 3.3 20% 16V	C136	S	1-131-449-11 CAP,TANT 3.3 20% 16V
C35	S	1-136-141-00 CAP,MYLAR 0.001 5% 50V	C137	S	1-161-894-00 CAP,CERAMIC 0.1 50V
C36	S	1-136-141-00 CAP,MYLAR 0.001 5% 50V	C138	S	1-131-450-00 CAP,TANT 1 20% 50V
C37	S	1-101-004-00 CAP,CERAMIC 0.01 50V	C139	S	1-107-054-00 CAP,MICA 33P 10% 500V
C38	S	1-101-004-00 CAP,CERAMIC 0.01 50V	C140	S	1-124-721-41 CAP,ELECT 10 20% 50V
C39	S	1-131-449-11 CAP,TANT 3.3 20% 16V	C141	S	1-124-721-41 CAP,ELECT 10 20% 50V
C40	S	1-131-450-00 CAP,TANT 1 20% 50V	C142	S	1-161-894-00 CAP,CERAMIC 0.1 50V
C41	S	1-101-004-00 CAP,CERAMIC 0.01 50V	C143	S	1-161-894-00 CAP,CERAMIC 0.1 50V
C42	S	1-101-004-00 CAP,CERAMIC 0.01 50V	C144	S	1-124-721-41 CAP,ELECT 10 20% 50V
C43	S	1-101-004-00 CAP,CERAMIC 0.01 50V	C145	S	1-124-721-41 CAP,ELECT 10 20% 50V
C44	S	1-101-004-00 CAP,CERAMIC 0.01 50V	C146	S	1-161-894-00 CAP,CERAMIC 0.1 50V
C45	S	1-101-004-00 CAP,CERAMIC 0.01 50V	C147	S	1-161-894-00 CAP,CERAMIC 0.1 50V
			C148	S	1-124-477-11 CAP,ELECT 47 20% 25V
			C149	S	1-161-894-00 CAP,CERAMIC 0.1 50V
			C150	S	1-124-721-41 CAP,ELECT 10 20% 50V
			C151	S	1-161-894-00 CAP,CERAMIC 0.1 50V
			C201	S	1-130-479-00 CAP,MYLAR 0.0047 5% 50V
			C202	S	1-131-449-11 CAP,TANT 3.3 20% 16V

Ref.No. or Qty	SP	Part No.	Description			Ref.No. or Qty	SP	Part No.	Description
C203	S	1-161-894-00	CAP,CERAMIC 0.1	50V		IC1	S	8-719-120-23	DIODE PS2003B-KA
C204	S	1-162-176-00	CAP,CERAMIC 1.5	25V		IC2	S	8-759-200-30	IC TC40H158P
C205	S	1-162-176-00	CAP,CERAMIC 1.5	25V		IC3	S	8-719-901-87	DIODE HCPL2630
C206	S	1-104-239-00	CAP,STYROL 1500P	5% 125V		IC4	S	8-759-220-02	IC TC40H002P
C207	S	1-161-461-00	CAP,CERAMIC 150P	5% 50V		IC5	S	8-759-220-04	IC TC40H004P
C208	S	1-131-449-11	CAP,TANT 3.3	20% 16V		IC6	S	8-759-200-34	IC TC40H163P
C209	S	1-136-141-00	CAP,MYLAR 0.001	5% 50V		IC7	S	8-759-200-21	IC TC40H107AP
C210	S	1-136-141-00	CAP,MYLAR 0.001	5% 50V		IC8	S	8-759-220-02	IC TC40H002P
C211	S	1-136-141-00	CAP,MYLAR 0.001	5% 50V		IC9	S	8-719-901-87	DIODE HCPL2630
C213	S	1-131-449-11	CAP,TANT 3.3	20% 16V		IC10	S	8-759-220-74	IC TC40H074P
C214	S	1-131-450-00	CAP,TANT 1	20% 50V		IC11	S	8-759-301-95	IC HD74HC125P
C215	S	1-131-450-00	CAP,TANT 1	20% 50V		IC12	S	8-759-220-74	IC TC40H074P
C216	S	1-161-894-00	CAP,CERAMIC 0.1	50V		IC13	S	8-759-220-04	IC TC40H004P
C217	S	1-124-721-41	CAP,ELECT 10	20% 50V		IC14	S	8-759-920-33	IC MM5437N
C218	S	1-131-450-00	CAP,TANT 1	20% 50V		IC15	S	8-759-001-16	IC MC10116L
C219	S	1-131-450-00	CAP,TANT 1	20% 50V		IC16	S	8-759-920-33	IC MM5437N
C220	S	1-131-450-00	CAP,TANT 1	20% 50V		IC101	S	8-759-900-72	IC NE5532P
C221	S	1-131-450-00	CAP,TANT 1	20% 50V		IC102	S	8-759-910-83	IC TL072ACP
C223	S	1-162-176-00	CAP,CERAMIC 1.5	25V		IC103	S	8-759-910-83	IC TL072ACP
C224	S	1-131-450-00	CAP,TANT 1	20% 50V		IC104	S	8-759-905-42	IC NE5534P
C225	S	1-131-450-00	CAP,TANT 1	20% 50V		IC106	S	8-759-108-96	IC uPC811C
C226	S	1-131-450-00	CAP,TANT 1	20% 50V		IC107	S	8-759-108-96	IC uPC811C
C227	S	1-161-894-00	CAP,CERAMIC 0.1	50V		IC108	S	8-759-918-92	IC HA3-2525-5
C228	S	1-124-721-41	CAP,ELECT 10	20% 50V		IC109	S	8-752-001-80	IC CX20018
C229	S	1-131-450-00	CAP,TANT 1	20% 50V		IC201	S	8-759-900-72	IC NE5532P
C230	S	1-131-450-00	CAP,TANT 1	20% 50V		IC202	S	8-759-910-83	IC TL072ACP
C231	S	1-131-450-00	CAP,TANT 1	20% 50V		IC203	S	8-759-910-83	IC TL072ACP
C232	S	1-131-450-00	CAP,TANT 1	20% 50V		IC204	S	8-759-905-42	IC NE5534P
C233	S	1-131-450-00	CAP,TANT 1	20% 50V		IC206	S	8-759-108-96	IC uPC811C
C234	S	1-131-449-11	CAP,TANT 3.3	20% 16V		IC207	S	8-759-108-96	IC uPC811C
C235	S	1-124-697-41	CAP,ELECT 47	20% 25V		IC208	S	8-759-918-92	IC HA3-2525-5
C236	S	1-131-449-11	CAP,TANT 3.3	20% 16V		IC209	S	8-752-001-80	IC CX20018
C237	S	1-161-894-00	CAP,CERAMIC 0.1	50V		L1	S	1-409-309-00	COIL,SN 72UH
C238	S	1-131-450-00	CAP,TANT 1	20% 50V		L2	S	1-535-178-00	RES,FERRITE
C239	S	1-107-054-00	CAP,MICA 33	10% 500V		L3	S	1-409-309-00	COIL,SN 72UH
C240	S	1-124-721-41	CAP,ELECT 10	20% 50V		L4	S	1-535-178-00	RES,FERRITE
C241	S	1-124-721-41	CAP,ELECT 10	20% 50V		L5	S	1-535-178-00	RES,FERRITE
C242	S	1-161-894-00	CAP,CERAMIC 0.1	50V		L6	S	1-535-178-00	RES,FERRITE
C243	S	1-161-894-00	CAP,CERAMIC 0.1	50V		L7	S	1-409-309-00	COIL,SN 72UH
C244	S	1-124-721-41	CAP,ELECT 10	20% 50V		L8	S	1-409-309-00	COIL,SN 72UH
C245	S	1-124-721-41	CAP,ELECT 10	20% 50V		L9	S	1-407-682-00	INDUCTOR,MICRO 1.2 10%
C246	S	1-161-894-00	CAP,CERAMIC 0.1	50V		L10	S	1-407-681-00	INDUCTOR,MICRO 1 10%
C247	S	1-161-894-00	CAP,CERAMIC 0.1	50V		L11	S	1-535-178-00	RES,FERRITE
C248	S	1-124-777-11	CAP,ELECT 47	20% 25V		L12	S	1-535-178-00	RES,FERRITE
C249	S	1-161-894-00	CAP,CERAMIC 0.1	50V		L101	S	1-535-178-00	RES,FERRITE
C250	S	1-124-721-41	CAP,ELECT 10	20% 50V		L102	S	1-535-178-00	RES,FERRITE
C251	S	1-161-894-00	CAP,CERAMIC 0.1	50V		L103	S	1-535-178-00	RES,FERRITE
C301	S	1-102-864-00	CAP,CERAMIC 5P	0.5P 50V		L104	S	1-535-178-00	RES,FERRITE
C302	S	1-102-864-00	CAP,CERAMIC 5P	0.5P 50V		L105	S	1-535-178-00	RES,FERRITE
CV1	S	1-141-245-00	TRIMMER,CERAMIC			L106	S	1-535-178-00	RES,FERRITE
D1	S	8-719-911-19	DIODE 1SS119			L107	S	1-535-178-00	RES,FERRITE
D2	S	8-719-911-19	DIODE 1SS119			L201	S	1-535-178-00	RES,FERRITE
D3	S	8-719-911-19	DIODE 1SS119			L202	S	1-535-178-00	RES,FERRITE
D101	S	8-719-911-19	DIODE 1SS119			L203	S	1-535-178-00	RES,FERRITE
D102	S	8-719-911-19	DIODE 1SS119			L204	S	1-535-178-00	RES,FERRITE
D103	S	8-719-911-19	DIODE 1SS119			L205	S	1-535-178-00	RES,FERRITE
D104	S	8-719-911-19	DIODE 1SS119			L206	S	1-535-178-00	RES,FERRITE
D105	S	8-719-951-12	DIODE HZ5BLL			L207	S	1-535-178-00	RES,FERRITE
D201	S	8-719-911-19	DIODE 1SS119			Q1	S	8-759-171-15	IC UPC7815H
D202	S	8-719-911-19	DIODE 1SS119			Q2	S	8-759-179-15	IC UPC7915H
D203	S	8-719-911-19	DIODE 1SS119			Q3	S	8-759-171-15	IC UPC7815H
D204	S	8-719-911-19	DIODE 1SS119			Q4	S	8-759-179-15	IC UPC7915H
D205	S	8-719-951-12	DIODE HZ5BLL			Q5	S	8-759-700-28	IC NJM7905A
						Q6	S	8-759-700-51	IC NJM7805A
						Q7	S	8-759-700-28	IC NJM7905A

Ref.No. or Qty	SP	Part No.	Description
Q101	S	8-729-800-43	TRANSISTOR 2SK152-3
Q102	S	8-729-699-51	TRANSISTOR 2SA995
Q103	S	8-729-800-43	TRANSISTOR 2SK152-3
Q201	S	8-729-800-43	TRANSISTOR 2SK152-3
Q202	S	8-729-699-51	TRANSISTOR 2SA995
Q203	S	8-729-800-43	TRANSISTOR 2SK152-3
R1	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R2	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R3	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R4	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R5	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R6	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R7	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R8	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R9	S	1-214-130-00	RES,METAL 820 1% 1/4W
R10	S	1-214-130-00	RES,METAL 820 1% 1/4W
R11	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R12	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R13	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R14	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R15	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R16	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R17	S	1-214-937-00	RES,METAL 1M 1% 1/2W
R18	S	1-214-937-00	RES,METAL 1M 1% 1/2W
R19	S	1-214-913-00	RES,METAL 100K 1% 1/2W
R20	S	1-214-913-00	RES,METAL 100K 1% 1/2W
R21	S	1-214-124-00	RES,METAL 470 1% 1/4W
R22	S	1-214-152-00	RES,METAL 6.8K 1% 1/4W
R23	S	1-214-126-00	RES,METAL 560 1% 1/4W
R24	S	1-214-126-00	RES,METAL 560 1% 1/4W
R25	S	1-214-142-00	RES,METAL 2.7K 1% 1/4W
R26	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R27	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R101	S	1-214-896-31	RES,METAL 20K 1% 1/2W
R102	S	1-214-888-00	RES,METAL 10K 1% 1/2W
R103	S	1-214-896-31	RES,METAL 20K 1% 1/2W
R104	S	1-214-888-00	RES,METAL 10K 1% 1/2W
R106	S	1-214-875-00	RES,METAL 3K 1% 1/2W
R107	S	1-214-847-00	RES,METAL 200 1% 1/2W
R108	S	1-214-874-00	RES,METAL 2.7K 1% 1/2W
R109	S	1-214-892-00	RES,METAL 15K 1% 1/2W
R110	S	1-214-892-00	RES,METAL 15K 1% 1/2W
R111	S	1-214-865-00	RES,METAL 1.1K 1% 1/2W
R112	S	1-214-159-00	RES,METAL 13K 1% 1/4W
R113	S	1-214-139-00	RES,METAL 2K 1% 1/4W
R114	S	1-214-937-00	RES,METAL 1M 1% 1/2W
R115	S	1-214-875-00	RES,METAL 3K 1% 1/2W
R116	S	1-214-863-00	RES,METAL 910 1% 1/2W
R117	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R118	S	1-214-872-00	RES,METAL 2.2K 1% 1/2W
R119	S	1-214-877-00	RES,METAL 3.6K 1% 1/2W
R120	S	1-214-937-00	RES,METAL 1M 1% 1/2W
R121	S	1-214-937-00	RES,METAL 1M 1% 1/2W
R122	S	1-214-889-00	RES,METAL 11K 1% 1/2W
R123	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R124	S	1-214-111-00	RES,METAL 130 1% 1/4W
R125	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R126	S	1-214-147-00	RES,METAL 4.3K 1% 1/4W
R127	S	1-214-152-00	RES,METAL 6.8K 1% 1/4W
R128	S	1-214-166-00	RES,METAL 27K 1% 1/4W
R129	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R130	S	1-214-139-00	RES,METAL 2K 1% 1/4W
R131	S	1-214-152-00	RES,METAL 6.8K 1% 1/4W
R132	S	1-214-154-00	RES,METAL 8.2K 1% 1/4W
R133	S	1-214-126-00	RES,METAL 560 1% 1/4W
R134	S	1-214-126-00	RES,METAL 560 1% 1/4W

Ref.No. or Qty	SP	Part No.	Description
R135	S	1-214-130-00	RES,METAL 820 1% 1/4W
R136	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R137	S	1-214-108-00	RES,METAL 100 1% 1/4W
R138	S	1-214-108-00	RES,METAL 100 1% 1/4W
R139	S	1-214-147-00	RES,METAL 4.3K 1% 1/4W
R140	S	1-210-828-00	RES,CARBON 4.7M 5% 1/4W
R141	S	1-215-493-00	RES,METAL 1M 1% 1/6W
R142	S	1-214-892-00	RES,METAL 15K 1% 1/2W
R143	S	1-214-168-00	RES,METAL 33K 1% 1/4W
R144	S	1-214-153-00	RES,METAL 7.5K 1% 1/4W
R145	S	1-214-153-00	RES,METAL 7.5K 1% 1/4W
R201	S	1-214-896-31	RES,METAL 20K 1% 1/2W
R202	S	1-214-888-00	RES,METAL 10K 1% 1/2W
R203	S	1-214-896-31	RES,METAL 20K 1% 1/2W
R204	S	1-214-888-00	RES,METAL 10K 1% 1/2W
R206	S	1-214-875-00	RES,METAL 3K 1% 1/2W
R207	S	1-214-847-00	RES,METAL 200 1% 1/2W
R208	S	1-214-874-00	RES,METAL 2.7K 1% 1/2W
R209	S	1-214-892-00	RES,METAL 15K 1% 1/2W
R210	S	1-214-892-00	RES,METAL 15K 1% 1/2W
R211	S	1-214-865-00	RES,METAL 1.1K 1% 1/2W
R212	S	1-214-159-00	RES,METAL 13K 1% 1/4W
R213	S	1-214-139-00	RES,METAL 2K 1% 1/4W
R214	S	1-214-937-00	RES,METAL 1M 1% 1/2W
R215	S	1-214-875-00	RES,METAL 3K 1% 1/2W
R216	S	1-214-863-00	RES,METAL 910 1% 1/2W
R217	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R218	S	1-214-872-00	RES,METAL 2.2K 1% 1/2W
R219	S	1-214-877-00	RES,METAL 3.6K 1% 1/2W
R220	S	1-214-937-00	RES,METAL 1M 1% 1/2W
R221	S	1-214-937-00	RES,METAL 1M 1% 1/2W
R222	S	1-214-889-00	RES,METAL 11K 1% 1/2W
R223	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R224	S	1-214-111-00	RES,METAL 130 1% 1/4W
R225	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R226	S	1-214-147-00	RES,METAL 4.3K 1% 1/4W
R227	S	1-214-152-00	RES,METAL 6.8K 1% 1/4W
R228	S	1-214-166-00	RES,METAL 27K 1% 1/4W
R229	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R230	S	1-214-139-00	RES,METAL 2K 1% 1/4W
R231	S	1-214-152-00	RES,METAL 6.8K 1% 1/4W
R232	S	1-214-154-00	RES,METAL 8.2K 1% 1/4W
R233	S	1-214-126-00	RES,METAL 560 1% 1/4W
R234	S	1-214-126-00	RES,METAL 560 1% 1/4W
R235	S	1-214-130-00	RES,METAL 820 1% 1/4W
R236	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R237	S	1-214-108-00	RES,METAL 100 1% 1/4W
R238	S	1-214-108-00	RES,METAL 100 1% 1/4W
R239	S	1-214-147-00	RES,METAL 4.3K 1% 1/4W
R240	S	1-210-828-00	RES,CARBON 4.7M 5% 1/4W
R241	S	1-215-493-00	RES,METAL 1M 1% 1/6W
R242	S	1-214-892-00	RES,METAL 15K 1% 1/2W
R243	S	1-214-168-00	RES,METAL 33K 1% 1/4W
R244	S	1-214-153-00	RES,METAL 7.5K 1% 1/4W
R245	S	1-214-153-00	RES,METAL 7.5K 1% 1/4W
RV101	S	1-230-879-11	RES,VAR,CARBON 10K
RV102	S	1-228-763-00	RES,ADJ,CERMET 5K
RV103	S	1-228-763-00	RES,ADJ,CERMET 5K
RV201	S	1-230-879-11	RES,VAR,CARBON 10K
RV202	S	1-228-763-00	RES,ADJ,CERMET 5K
RV203	S	1-228-763-00	RES,ADJ,CERMET 5K

Ref.No. or Qty SP	Part No.	Description	Ref.No. or Qty SP	Part No.	Description
SW1	S 1-553-441-00	SWITCH, TOGGLE	C36	S 1-124-477-11	CAP, ELECT 47 20% 25V
SW2	S 1-552-430-00	SWITCH, SLIDE	C37	S 1-161-894-00	CAP, CERAMIC 0.1 50V
			C38	S 1-124-478-11	CAP, ELECT 100 20% 25V
X1	S 1-567-185-00	CRYSTAL 48.0010MHZ	C39	S 1-161-894-00	CAP, CERAMIC 0.1 50V
			C40	S 1-124-478-11	CAP, ELECT 100 20% 25V
			C41	S 1-161-894-00	CAP, CERAMIC 0.1 50V
			C42	S 1-161-894-00	CAP, CERAMIC 0.1 50V
			C43	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C44	S 1-124-478-11	CAP, ELECT 100 20% 25V
			C45	S 1-124-478-11	CAP, ELECT 100 20% 25V
			C46	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C47	S 1-131-449-11	CAP, TANT 3.3 20% 16V
			C48	S 1-130-477-00	CAP, MYLAR 0.0033 5% 50V
			C49	S 1-130-476-00	CAP, MYLAR 0.0027 5% 50V
			C50	S 1-107-169-00	CAP, MICA 100P 5% 500V
			C51	S 1-107-169-00	CAP, MICA 100P 5% 500V
			C52	S 1-161-894-00	CAP, CERAMIC 0.1 50V
			C53	S 1-161-894-00	CAP, CERAMIC 0.1 50V
			C54	S 1-124-721-41	CAP, ELECT 10 20% 50V
			C55	S 1-130-471-00	CAP, MYLAR 0.001 5% 50V
			C56	S 1-124-721-41	CAP, ELECT 10 20% 50V
			C57	S 1-102-512-00	CAP, CERAMIC 16P 5% 50V
			C58	S 1-161-894-00	CAP, CERAMIC 0.1 50V
			C59	S 1-102-973-00	CAP, CERAMIC 100P 5% 50V
			C60	S 1-124-697-41	CAP, ELECT 47 20% 25V
			C61	S 1-161-894-00	CAP, CERAMIC 0.1 50V
			C62	S 1-124-478-11	CAP, ELECT 100 20% 25V
			C63	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C64	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C65	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C66	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C67	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C68	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C69	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C70	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C71	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C72	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C73	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C74	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C75	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C76	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C77	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C78	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C79	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C80	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C81	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C82	S 1-101-004-00	CAP, CERAMIC 0.01 50V
			C83	S 1-131-449-11	CAP, TANT 3.3 20% 16V
			C84	S 1-131-449-11	CAP, TANT 3.3 20% 16V
			C85	S 1-131-449-11	CAP, TANT 3.3 20% 16V
			C86	S 1-131-449-11	CAP, TANT 3.3 20% 16V
			C101	S 1-130-471-00	CAP, MYLAR 0.001 5% 50V
			C102	S 1-130-471-00	CAP, MYLAR 0.001 5% 50V
			C103	S 1-124-697-41	CAP, ELECT 47 20% 25V
			C104	S 1-161-894-00	CAP, CERAMIC 0.1 50V
			C105	S 1-131-449-11	CAP, TANT 3.3 20% 16V
			C106	S 1-131-449-11	CAP, TANT 3.3 20% 16V
			C107	S 1-131-449-11	CAP, TANT 3.3 20% 16V
			C109	S 1-131-449-11	CAP, TANT 3.3 20% 16V
			C110	S 1-104-239-00	CAP, STYROL 1500P 5% 125V
			C111	S 1-104-239-00	CAP, STYROL 1500P 5% 125V
			C112	S 1-131-450-00	CAP, TANT 1 20% 50V
			C113	S 1-131-450-00	CAP, TANT 1 20% 50V
			C114	S 1-131-450-00	CAP, TANT 1 20% 50V

DA-15 BOARD

1pc O A-7850-293-A COMPLETE PCB, DA-15
(This assembly includes the following parts.)

1pc S 2-251-622-00 LEVER, PC BOARD
1pc O 3-673-867-00 PLATE, INDICATION, PC BOARD
4pcs O 4-874-192-01 HEAT SINK
1pc O 4-911-745-01 CASE (LOWER), DA SHIELD
1pc O 4-911-746-01 CASE (UPPER), DA SHIELD

1pc O 4-911-704-41 LABEL (DA), PC BOARD
2pcs S 7-626-317-21 PIN, SPRING 2.5x8
4pcs S 7-682-547-04 SCREW, +B3x6
4pcs S 7-684-023-04 NUT, M3

AFL101 S 1-235-609-11 FILTER, LOW-PASS 24KHz
AFL201 S 1-235-609-11 FILTER, LOW-PASS 24KHz

C1 S 1-124-725-41 CAP, ELECT 100 20% 50V
C2 S 1-161-894-00 CAP, CERAMIC 0.1 50V
C3 S 1-124-725-41 CAP, ELECT 100 20% 50V
C4 S 1-161-894-00 CAP, CERAMIC 0.1 50V
C5 S 1-124-725-41 CAP, ELECT 100 20% 50V

C6 S 1-161-894-00 CAP, CERAMIC 0.1 50V
C7 S 1-124-725-41 CAP, ELECT 100 20% 50V
C8 S 1-161-894-00 CAP, CERAMIC 0.1 50V
C9 S 1-124-725-41 CAP, ELECT 100 20% 50V
C10 S 1-161-894-00 CAP, CERAMIC 0.1 50V

C11 S 1-124-725-41 CAP, ELECT 100 20% 50V
C12 S 1-161-894-00 CAP, CERAMIC 0.1 50V
C13 S 1-131-450-00 CAP, TANT 1 20% 50V
C14 S 1-124-724-41 CAP, ELECT 47 20% 50V
C15 S 1-161-894-00 CAP, CERAMIC 0.1 50V

C16 S 1-131-450-00 CAP, TANT 1 20% 50V
C17 S 1-124-724-41 CAP, ELECT 47 20% 50V
C18 S 1-161-894-00 CAP, CERAMIC 0.1 50V
C19 S 1-131-450-00 CAP, TANT 1 20% 50V
C20 S 1-124-725-41 CAP, ELECT 100 20% 50V

C21 S 1-161-894-00 CAP, CERAMIC 0.1 50V
C22 S 1-131-450-00 CAP, TANT 1 20% 50V
C23 S 1-124-725-41 CAP, ELECT 100 20% 50V
C24 S 1-161-894-00 CAP, CERAMIC 0.1 50V
C25 S 1-131-450-00 CAP, TANT 1 20% 50V

C26 S 1-124-724-41 CAP, ELECT 47 20% 50V
C27 S 1-161-894-00 CAP, CERAMIC 0.1 50V
C28 S 1-131-450-00 CAP, TANT 1 20% 50V
C29 S 1-124-724-41 CAP, ELECT 47 20% 50V
C30 S 1-161-894-00 CAP, CERAMIC 0.1 50V

C31 S 1-131-450-00 CAP, TANT 1 20% 50V
C32 S 1-124-721-41 CAP, ELECT 10 20% 50V
C33 S 1-161-894-00 CAP, CERAMIC 0.1 50V
C34 S 1-124-477-11 CAP, ELECT 47 20% 25V
C35 S 1-161-894-00 CAP, CERAMIC 0.1 50V

Ref.No. or Qty SP	Part No.	Description				Ref.No. or Qty SP	Part No.	Description			
C115	S	1-131-450-00	CAP,TANT	1	20% 50V	C214	S	1-131-450-00	CAP,TANT	1	20% 50V
C116	S	1-124-721-41	CAP,ELECT	10	20% 50V	C215	S	1-131-450-00	CAP,TANT	1	20% 50V
C117	S	1-124-721-41	CAP,ELECT	10	20% 50V	C216	S	1-124-721-41	CAP,ELECT	10	20% 50V
C118	S	1-124-721-41	CAP,ELECT	10	20% 50V	C217	S	1-124-721-41	CAP,ELECT	10	20% 50V
C119	S	1-131-449-11	CAP,TANT	3.3	20% 16V	C218	S	1-124-721-41	CAP,ELECT	10	20% 50V
C120	S	1-131-449-11	CAP,TANT	3.3	20% 16V	C219	S	1-131-449-11	CAP,TANT	3.3	20% 16V
C121	S	1-131-449-11	CAP,TANT	3.3	20% 16V	C220	S	1-131-449-11	CAP,TANT	3.3	20% 16V
C123	S	1-131-449-11	CAP,TANT	3.3	20% 16V	C221	S	1-131-449-11	CAP,TANT	3.3	20% 16V
C124	S	1-107-054-00	CAP,MICA	33P	10% 500V	C223	S	1-131-449-11	CAP,TANT	3.3	20% 16V
C125	S	1-131-450-00	CAP,TANT	1	20% 50V	C224	S	1-107-054-00	CAP,MICA	33P	10% 500V
C126	S	1-131-450-00	CAP,TANT	1	20% 50V	C225	S	1-131-450-00	CAP,TANT	1	20% 50V
C127	S	1-124-724-41	CAP,ELECT	47	20% 50V	C226	S	1-131-450-00	CAP,TANT	1	20% 50V
C128	S	1-161-894-00	CAP,CERAMIC	0.1	50V	C227	S	1-124-724-41	CAP,ELECT	47	20% 50V
C129	S	1-124-724-41	CAP,ELECT	47	20% 50V	C228	S	1-161-894-00	CAP,CERAMIC	0.1	50V
C130	S	1-161-894-00	CAP,CERAMIC	0.1	50V	C229	S	1-124-724-41	CAP,ELECT	47	20% 50V
C131	S	1-131-450-00	CAP,TANT	1	20% 50V	C230	S	1-161-894-00	CAP,CERAMIC	0.1	50V
C132	S	1-131-450-00	CAP,TANT	1	20% 50V	C231	S	1-131-450-00	CAP,TANT	1	20% 50V
C133	S	1-130-479-00	CAP,MYLAR	0.0047	5% 50V	C232	S	1-131-450-00	CAP,TANT	1	20% 50V
C134	S	1-131-450-00	CAP,TANT	1	20% 50V	C233	S	1-130-479-00	CAP,MYLAR	0.0047	5% 50V
C135	S	1-131-450-00	CAP,TANT	1	20% 50V	C234	S	1-131-450-00	CAP,TANT	1	20% 50V
C136	S	1-162-176-00	CAP,CERAMIC	1.5	25V	C235	S	1-131-450-00	CAP,TANT	1	20% 50V
C137	S	1-162-176-00	CAP,CERAMIC	1.5	25V	C236	S	1-162-176-00	CAP,CERAMIC	1.5	25V
C138	S	1-131-450-00	CAP,TANT	1	20% 50V	C237	S	1-162-176-00	CAP,CERAMIC	1.5	25V
C139	S	1-131-450-00	CAP,TANT	1	20% 50V	C238	S	1-131-450-00	CAP,TANT	1	20% 50V
C140	S	1-131-449-11	CAP,TANT	3.3	20% 16V	C239	S	1-131-450-00	CAP,TANT	1	20% 50V
C141	S	1-131-449-11	CAP,TANT	3.3	20% 16V	C240	S	1-131-449-11	CAP,TANT	3.3	20% 16V
C142	S	1-161-894-00	CAP,CERAMIC	0.1	50V	C241	S	1-131-449-11	CAP,TANT	3.3	20% 16V
C143	S	1-131-450-00	CAP,TANT	1	20% 50V	C242	S	1-161-894-00	CAP,CERAMIC	0.1	50V
C144	S	1-131-450-00	CAP,TANT	1	20% 50V	C243	S	1-131-450-00	CAP,TANT	1	20% 50V
C145	S	1-124-724-41	CAP,ELECT	47	20% 50V	C244	S	1-131-450-00	CAP,TANT	1	20% 50V
C146	S	1-124-724-41	CAP,ELECT	47	20% 50V	C245	S	1-124-724-41	CAP,ELECT	47	20% 50V
C147	S	1-131-450-00	CAP,TANT	1	20% 50V	C246	S	1-124-724-41	CAP,ELECT	47	20% 50V
C148	S	1-131-450-00	CAP,TANT	1	20% 50V	C247	S	1-131-450-00	CAP,TANT	1	20% 50V
C149	S	1-107-036-00	CAP,MICA	68P	5% 500V	C248	S	1-131-450-00	CAP,TANT	1	20% 50V
C150	S	1-107-054-00	CAP,MICA	33P	10% 500V	C249	S	1-107-036-00	CAP,MICA	68P	5% 500V
C151	S	1-107-054-00	CAP,MICA	33P	10% 500V	C250	S	1-107-054-00	CAP,MICA	33P	10% 500V
C152	S	1-131-450-00	CAP,TANT	1	20% 50V	C251	S	1-107-054-00	CAP,MICA	33P	10% 500V
C153	S	1-124-724-41	CAP,ELECT	47	20% 50V	C252	S	1-131-450-00	CAP,TANT	1	20% 50V
C154	S	1-131-450-00	CAP,TANT	1	20% 50V	C253	S	1-124-724-41	CAP,ELECT	47	20% 50V
C155	S	1-124-724-41	CAP,ELECT	47	20% 50V	C254	S	1-131-450-00	CAP,TANT	1	20% 50V
C156	S	1-131-450-00	CAP,TANT	1	20% 50V	C255	S	1-124-724-41	CAP,ELECT	47	20% 50V
C157	S	1-131-450-00	CAP,TANT	1	20% 50V	C256	S	1-131-450-00	CAP,TANT	1	20% 50V
C158	S	1-107-036-00	CAP,MICA	68P	5% 500V	C257	S	1-131-450-00	CAP,TANT	1	20% 50V
C159	S	1-107-054-00	CAP,MICA	33P	10% 500V	C258	S	1-107-036-00	CAP,MICA	68P	5% 500V
C160	S	1-107-054-00	CAP,MICA	33P	10% 500V	C259	S	1-107-054-00	CAP,MICA	33P	10% 500V
C161	S	1-131-450-00	CAP,TANT	1	20% 50V	C260	S	1-107-054-00	CAP,MICA	33P	10% 500V
C162	S	1-124-724-41	CAP,ELECT	47	20% 50V	C261	S	1-131-450-00	CAP,TANT	1	20% 50V
C163	S	1-131-450-00	CAP,TANT	1	20% 50V	C262	S	1-124-724-41	CAP,ELECT	47	20% 50V
C164	S	1-124-724-41	CAP,ELECT	47	20% 50V	C263	S	1-131-450-00	CAP,TANT	1	20% 50V
C165	S	1-102-518-00	CAP,CERAMIC	33P	5% 50V	C264	S	1-124-724-41	CAP,ELECT	47	20% 50V
C166	S	1-131-449-11	CAP,TANT	3.3	20% 16V	C265	S	1-102-518-00	CAP,CERAMIC	33P	5% 50V
C167	S	1-131-449-11	CAP,TANT	3.3	20% 16V	C266	S	1-131-449-11	CAP,TANT	3.3	20% 16V
C168	S	1-131-449-11	CAP,TANT	3.3	20% 16V	C267	S	1-131-449-11	CAP,TANT	3.3	20% 16V
C169	S	1-104-069-00	CAP,STYROL	470P	5% 50V	C268	S	1-131-449-11	CAP,TANT	3.3	20% 16V
C170	S	1-162-176-00	CAP,CERAMIC	1.5	25V	C269	S	1-104-069-00	CAP,STYROL	470P	5% 50V
C171	S	1-131-450-00	CAP,TANT	1	20% 50V	C270	S	1-162-176-00	CAP,CERAMIC	1.5	25V
C201	S	1-130-471-00	CAP,MYLAR	0.001	5% 50V	C271	S	1-131-450-00	CAP,TANT	1	20% 50V
C202	S	1-130-471-00	CAP,MYLAR	0.001	5% 50V	C301	S	1-102-852-00	CAP,CERAMIC	47P	5% 50V
C203	S	1-124-697-41	CAP,ELECT	47	20% 25V	C302	S	1-136-165-00	CAP,FILM	0.1	5% 50V
C204	S	1-161-894-00	CAP,CERAMIC	0.1	50V	C303	S	1-136-165-00	CAP,FILM	0.1	5% 50V
C205	S	1-131-449-11	CAP,TANT	3.3	20% 16V	CV1	S	1-141-245-00	TRIMMER,CERAMIC		
C206	S	1-131-449-11	CAP,TANT	3.3	20% 16V	D1	S	8-719-911-19	DIODE 1SS119		
C207	S	1-131-449-11	CAP,TANT	3.3	20% 16V	D2	S	8-719-911-19	DIODE 1SS119		
C209	S	1-131-449-11	CAP,TANT	3.3	20% 16V	D3	S	8-719-911-19	DIODE 1SS119		
C210	S	1-104-239-00	CAP,STYROL	1500P	5% 125V	D4	S	8-719-911-19	DIODE 1SS119		
C211	S	1-104-239-00	CAP,STYROL	1500P	5% 125V	D5	S	8-719-915-20	DIODE FC52M		
C212	S	1-131-450-00	CAP,TANT	1	20% 50V	D6	S	8-719-911-19	DIODE 1SS119		
C213	S	1-131-450-00	CAP,TANT	1	20% 50V						

Ref.No. or Qty	SP	Part No.	Description
D101	S	8-719-951-12	DIODE HZ5BLL
D102	S	8-719-951-12	DIODE HZ5BLL
D103	S	8-719-911-19	DIODE 1SS119
D104	S	8-719-911-19	DIODE 1SS119
D106	S	8-719-911-19	DIODE 1SS119
D107	S	8-719-911-19	DIODE 1SS119
D108	S	8-719-911-19	DIODE 1SS119
D109	S	8-719-911-19	DIODE 1SS119
D110	S	8-719-200-02	DIODE 10E-2
D111	S	8-719-911-19	DIODE 1SS119
D112	S	8-719-911-19	DIODE 1SS119
D113	S	8-719-911-19	DIODE 1SS119
D114	S	8-719-911-19	DIODE 1SS119
D115	S	8-719-911-19	DIODE 1SS119
D116	S	8-719-911-19	DIODE 1SS119
D117	S	8-719-911-19	DIODE 1SS119
D118	S	8-719-911-19	DIODE 1SS119
D119	S	8-719-911-19	DIODE 1SS119
D201	S	8-719-951-12	DIODE HZ5BLL
D202	S	8-719-951-12	DIODE HZ5BLL
D203	S	8-719-911-19	DIODE 1SS119
D204	S	8-719-911-19	DIODE 1SS119
D206	S	8-719-911-19	DIODE 1SS119
D207	S	8-719-911-19	DIODE 1SS119
D208	S	8-719-911-19	DIODE 1SS119
D209	S	8-719-911-19	DIODE 1SS119
D210	S	8-719-200-02	DIODE 10E-2
D211	S	8-719-911-19	DIODE 1SS119
D212	S	8-719-911-19	DIODE 1SS119
D213	S	8-719-911-19	DIODE 1SS119
D214	S	8-719-911-19	DIODE 1SS119
D215	S	8-719-911-19	DIODE 1SS119
D216	S	8-719-911-19	DIODE 1SS119
D217	S	8-719-911-19	DIODE 1SS119
D218	S	8-719-911-19	DIODE 1SS119
D219	S	8-719-911-19	DIODE 1SS119
D301, 302	S	8-719-951-12	DIODE HZ5BLL (Only up to Serial No. 10126, and from 10201 to 10204)
IC1	S	8-759-001-16	IC MC10116L
IC2	S	8-759-220-04	IC TC40H004P
IC3	S	8-759-200-27	IC TC40H153P
IC4	S	8-759-921-03	IC CXD1027P
IC5	S	8-759-921-03	IC CXD1027P
IC6	S	8-759-220-00	IC TC40H000P
IC7	S	8-759-221-75	IC TC40H175P
IC8	S	8-759-200-32	IC TC40H161P
IC9	S	8-759-200-09	IC TC40H393P
IC10	S	8-759-200-05	IC TC40H008P
IC11	S	8-759-220-04	IC TC40H004P
IC12	S	8-759-220-74	IC TC40H074P
IC13	S	8-759-220-02	IC TC40H002P
IC14	S	8-759-200-32	IC TC40H161P
IC15	S	8-759-912-53	IC CX23034
IC16	S	8-759-016-48	IC MC1648P
IC17	S	8-752-306-50	IC CX23065
IC18	S	8-759-202-13	IC TC74HCU04P
IC19	S	8-759-220-74	IC TC40H074P
IC20	S	8-759-220-74	IC TC40H074P
IC21	S	8-759-200-05	IC TC40H008P
IC22	S	8-759-220-00	IC TC40H000P
IC24	S	8-759-220-04	IC TC40H004P
IC101	S	8-752-015-20	IC CX20152
IC102	S	8-759-108-96	IC uPC811C

Ref.No. or Qty	SP	Part No.	Description
IC103	S	8-759-108-96	IC uPC811C
IC104	S	8-759-240-53	IC TC4053BP (Only up to Serial No. 10800)
IC105	S	8-759-240-53	IC TC4053BP
IC106	S	8-759-925-25	IC HA7-2525-5
IC107	S	8-759-108-96	IC uPC811C
IC108	S	8-759-900-72	IC NE5532P
IC109	S	8-759-910-83	IC TL072ACP
IC110	S	8-759-240-53	IC TC4053BP
IC111	S	8-759-745-63	IC NJM4560D-X
IC112, 113	S	8-741-136-70	IC BX-1367 (Up to Serial No. 10126, and from 10201 to 10204)
		8-741-139-10	IC BX-1391 (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
IC201	S	8-752-015-20	IC CX20152
IC202	S	8-759-108-96	IC uPC811C
IC203	S	8-759-108-96	IC uPC811C
IC204	S	8-759-240-53	IC TC4053BP (Only up to Serial No. 10800)
IC205	S	8-759-240-53	IC TC4053BP
IC206	S	8-759-925-25	IC HA7-2525-5
IC207	S	8-759-108-96	IC uPC811C
IC208	S	8-759-900-72	IC NE5532P
IC209	S	8-759-910-83	IC TL072ACP
IC210	S	8-759-240-53	IC TC4053BP
IC211	S	8-759-745-63	IC NJM4560D-X
IC212, 213	S	8-741-136-70	IC BX-1367 (Up to Serial No. 10126, and from 10201 to 10204)
	S	8-741-139-10	IC BX-1391 (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
L1	S	1-409-309-00	COIL,SN 72
L2	S	1-409-309-00	COIL,SN 72
L3	S	1-409-309-00	COIL,SN 72
L4	S	1-409-309-00	COIL,SN 72
L5	S	1-535-178-00	RES,FERRITE
L6	S	1-535-178-00	RES,FERRITE
L7	S	1-535-178-00	RES,FERRITE
L8	S	1-535-178-00	RES,FERRITE
L9	S	1-535-178-00	RES,FERRITE
L10	S	1-535-178-00	RES,FERRITE
L11	S	1-535-178-00	RES,FERRITE
L12	S	1-535-178-00	RES,FERRITE
L13	S	1-426-111-00	COIL,RF
L14	S	1-408-400-00	INDUCTOR,MICRO 1.8 5%
L15	S	1-408-400-00	INDUCTOR,MICRO 1.8 5%
L16	S	1-535-178-00	RES,FERRITE
L101	S	1-535-178-00	RES,FERRITE
L102	S	1-408-879-21	INDUCTOR,MICRO 0.47 10%
L103	S	1-535-178-00	RES,FERRITE
L104	S	1-535-178-00	RES,FERRITE
L201	S	1-535-178-00	RES,FERRITE
L202	S	1-408-879-21	INDUCTOR,MICRO 0.47 10%
L203	S	1-535-178-00	RES,FERRITE
L204	S	1-535-178-00	RES,FERRITE

Ref.No. or Qty	SP	Part No.	Description
Q1	S	8-759-378-18	IC FS7818
Q2	S	8-759-179-18	IC UPC7918H
Q3	S	8-759-171-15	IC UPC7815H
Q4	S	8-759-179-15	IC UPC7915H
Q5	S	8-759-171-15	IC UPC7815H
Q6	S	8-759-179-15	IC UPC7915H
Q7	S	8-759-700-28	IC NJM7905A
Q8	S	8-759-700-51	IC NJM7805A
Q9	S	8-759-700-28	IC NJM7905A
Q10	S	8-729-993-72	TRANSISTOR 2SA937
Q11	S	8-729-965-22	TRANSISTOR 2SC1652
Q101	S	8-729-699-51	TRANSISTOR 2SA995
Q102	S	8-729-800-44	TRANSISTOR 2SK152-4
Q103	S	8-729-800-44	TRANSISTOR 2SK152-4
Q104	S	8-729-306-92	TRANSISTOR 2SD669A
Q105	S	8-729-304-92	TRANSISTOR 2SB649A
Q106	S	8-729-902-11	TRANSISTOR 2SC2021
Q107	S	8-729-306-92	TRANSISTOR 2SD669A
Q108	S	8-729-993-72	TRANSISTOR 2SA937
Q109	S	8-729-304-92	TRANSISTOR 2SB649A
Q110	S	8-729-902-11	TRANSISTOR 2SC2021
Q111	S	8-729-993-72	TRANSISTOR 2SA937
Q112	S	8-729-306-92	TRANSISTOR 2SD669A
Q113	S	8-729-304-92	TRANSISTOR 2SB649A
Q114	S	8-729-800-44	TRANSISTOR 2SK152-4
Q201	S	8-729-699-51	TRANSISTOR 2SA995
Q202	S	8-729-800-44	TRANSISTOR 2SK152-4
Q203	S	8-729-800-44	TRANSISTOR 2SK152-4
Q204	S	8-729-306-92	TRANSISTOR 2SD669A
Q205	S	8-729-304-92	TRANSISTOR 2SB649A
Q206	S	8-729-902-11	TRANSISTOR 2SC2021
Q207	S	8-729-306-92	TRANSISTOR 2SD669A
Q208	S	8-729-993-72	TRANSISTOR 2SA937
Q209	S	8-729-304-92	TRANSISTOR 2SB649A
Q210	S	8-729-902-11	TRANSISTOR 2SC2021
Q211	S	8-729-993-72	TRANSISTOR 2SA937
Q212	S	8-729-306-92	TRANSISTOR 2SD669A
Q213	S	8-729-304-92	TRANSISTOR 2SB649A
Q214	S	8-729-800-44	TRANSISTOR 2SK152-4
Q301	S	8-729-211-81	TRANSISTOR 2SK118
Q302	S	8-729-211-81	TRANSISTOR 2SK118
R2	S	1-207-634-00	RES,WIRE 68 10% 3W
R3	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R4	S	1-214-165-00	RES,METAL 24K 1% 1/4W
R5	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R6	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R7	S	1-214-173-00	RES,METAL 51K 1% 1/4W
R8	S	1-214-150-00	RES,METAL 5.6K 1% 1/4W
R9	S	1-214-126-00	RES,METAL 560 1% 1/4W
R10	S	1-214-126-00	RES,METAL 560 1% 1/4W
R11	S	1-214-126-00	RES,METAL 560 1% 1/4W
R12	S	1-214-126-00	RES,METAL 560 1% 1/4W
R13	S	1-214-126-00	RES,METAL 560 1% 1/4W
R14	S	1-214-126-00	RES,METAL 560 1% 1/4W
R15	S	1-214-135-00	RES,METAL 1.3K 1% 1/4W
R16	S	1-214-160-00	RES,METAL 15K 1% 1/4W
R17	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R18	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R19	S	1-214-131-00	RES,METAL 910 1% 1/4W
R20	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R101	S	1-214-140-00	RES,METAL 2.2K 1% 1/4W
R102	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
R103	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
R104	S	1-214-159-00	RES,METAL 13K 1% 1/4W
R105	S	1-214-158-00	RES,METAL 12K 1% 1/4W
R106	S	1-214-164-00	RES,METAL 22K 1% 1/4W

Ref.No. or Qty	SP	Part No.	Description
R107	S	1-214-159-00	RES,METAL 13K 1% 1/4W
R108	S	1-214-164-00	RES,METAL 22K 1% 1/4W
R109	S	1-214-159-00	RES,METAL 13K 1% 1/4W
R110	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R111	S	1-214-164-00	RES,METAL 22K 1% 1/4W
R112	S	1-214-147-00	RES,METAL 4.3K 1% 1/4W
R113	S	1-214-147-00	RES,METAL 4.3K 1% 1/4W
R115	S	1-214-160-00	RES,METAL 15K 1% 1/4W
R116	S	1-214-160-00	RES,METAL 15K 1% 1/4W
R117	S	1-214-143-00	RES,METAL 3K 1% 1/4W
R118	S	1-214-115-00	RES,METAL 200 1% 1/4W
R119	S	1-214-964-00	RES,METAL 1M 1% 1/4W
R120	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
R121	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
R122	S	1-214-141-00	RES,METAL 2.4K 1% 1/4W
R123	S	1-214-150-00	RES,METAL 5.6K 1% 1/4W
R124	S	1-214-964-00	RES,METAL 1M 1% 1/4W
R125	S	1-214-964-00	RES,METAL 1M 1% 1/4W
R126	S	1-214-160-00	RES,METAL 15K 1% 1/4W
R127	S	1-214-108-00	RES,METAL 100 1% 1/4W
R128	S	1-214-160-00	RES,METAL 15K 1% 1/4W
R129	S	1-214-160-00	RES,METAL 15K 1% 1/4W
R130	S	1-214-153-00	RES,METAL 7.5K 1% 1/4W
R131	S	1-214-153-00	RES,METAL 7.5K 1% 1/4W
R132	S	1-214-084-00	RES,METAL 10 1% 1/4W
R133	S	1-214-084-00	RES,METAL 10 1% 1/4W
R134	S	1-214-084-00	RES,METAL 10 1% 1/4W
R135	S	1-214-084-00	RES,METAL 10 1% 1/4W
R136	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R137	S	1-214-140-00	RES,METAL 2.2K 1% 1/4W
R138	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R139	S	1-214-163-00	RES,METAL 20K 1% 1/4W
R140	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R141	S	1-214-163-00	RES,METAL 20K 1% 1/4W
R142	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R143	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R144	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R145	S	1-214-084-00	RES,METAL 10 1% 1/4W
		(Up to Serial No. 10126, and from 10201 to 10204)	
	S	1-214-091-00	RES,METAL 20 1% 1/4W
		(Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)	
R146	S	1-214-156-00	RES,METAL 10K 1% 1/4W
		(Up to Serial No. 10126, and from 10201 to 10204)	
	S	1-214-158-00	RES,METAL 12K 1% 1/4W
		(Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)	
R147	S	1-214-163-00	RES,METAL 20K 1% 1/4W
R148	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R149	S	1-214-163-00	RES,METAL 20K 1% 1/4W
R150	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R151	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R152	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R153	S	1-214-084-00	RES,METAL 10 1% 1/4W
		(Up to Serial No. 10126, and from 10201 to 10204)	
	S	1-214-091-00	RES,METAL 20 1% 1/4W
		(Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)	
R154	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R155	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R156	S	1-214-173-00	RES,METAL 51K 1% 1/4W

Ref.No. or Qty	SP	Part No.	Description
R157	S	1-214-128-00	RES,METAL 680 1% 1/4W
R158	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R159	S	1-214-143-00	RES,METAL 3K 1% 1/4W
R160	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
R161	S	1-214-180-00	RES,METAL 100K 1% 1/4W (Up to Serial No. 10126, and from 10201 to 10204)
	S	1-214-964-00	RES,METAL 1M 1% 1/4W (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
R162	S	1-214-172-00	RES,METAL 47K 1% 1/4W
R201	S	1-214-140-00	RES,METAL 2.2K 1% 1/4W
R202	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
R203	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
R204	S	1-214-159-00	RES,METAL 13K 1% 1/4W
R205	S	1-214-158-00	RES,METAL 12K 1% 1/4W
R206	S	1-214-164-00	RES,METAL 22K 1% 1/4W
R207	S	1-214-159-00	RES,METAL 13K 1% 1/4W
R208	S	1-214-164-00	RES,METAL 22K 1% 1/4W
R209	S	1-214-159-00	RES,METAL 13K 1% 1/4W
R210	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R211	S	1-214-164-00	RES,METAL 22K 1% 1/4W
R212	S	1-214-147-00	RES,METAL 4.3K 1% 1/4W
R213	S	1-214-147-00	RES,METAL 4.3K 1% 1/4W
R215	S	1-214-160-00	RES,METAL 15K 1% 1/4W
R216	S	1-214-160-00	RES,METAL 15K 1% 1/4W
R217	S	1-214-143-00	RES,METAL 3K 1% 1/4W
R218	S	1-214-115-00	RES,METAL 200 1% 1/4W
R219	S	1-214-964-00	RES,METAL 1M 1% 1/4W
R220	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
R221	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
R222	S	1-214-141-00	RES,METAL 2.4K 1% 1/4W
R223	S	1-214-150-00	RES,METAL 5.6K 1% 1/4W
R224	S	1-214-964-00	RES,METAL 1M 1% 1/4W
R225	S	1-214-964-00	RES,METAL 1M 1% 1/4W
R226	S	1-214-160-00	RES,METAL 15K 1% 1/4W
R227	S	1-214-108-00	RES,METAL 100 1% 1/4W
R228	S	1-214-160-00	RES,METAL 15K 1% 1/4W
R229	S	1-214-160-00	RES,METAL 15K 1% 1/4W
R230	S	1-214-153-00	RES,METAL 7.5K 1% 1/4W
R231	S	1-214-153-00	RES,METAL 7.5K 1% 1/4W
R232	S	1-214-084-00	RES,METAL 10 1% 1/4W
R233	S	1-214-084-00	RES,METAL 10 1% 1/4W
R234	S	1-214-084-00	RES,METAL 10 1% 1/4W
R235	S	1-214-084-00	RES,METAL 10 1% 1/4W
R236	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R237	S	1-214-140-00	RES,METAL 2.2K 1% 1/4W
R238	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R239	S	1-214-163-00	RES,METAL 20K 1% 1/4W
R240	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R241	S	1-214-163-00	RES,METAL 20K 1% 1/4W
R242	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R243	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R244	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R245	S	1-214-084-00	RES,METAL 10 1% 1/4W (Up to Serial No. 10126, and from 10201 to 10204)
	S	1-214-091-00	RES,METAL 20 1% 1/4W (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
R246	S	1-214-156-00	RES,METAL 10K 1% 1/4W (Up to Serial No. 10126, and from 10201 to 10204)
	S	1-214-158-00	RES,METAL 12K 1% 1/4W (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
R247	S	1-214-163-00	RES,METAL 20K 1% 1/4W
R248	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R249	S	1-214-163-00	RES,METAL 20K 1% 1/4W

Ref.No. or Qty	SP	Part No.	Description
R250	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R251	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R252	S	1-214-669-00	RES,METAL 3.3 1% 1/4W
R253	S	1-214-084-00	RES,METAL 10 1% 1/4W (Up to Serial No. 10126, and from 10201 to 10204)
	S	1-214-091-00	RES,METAL 20 1% 1/4W (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
R254	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R255	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R256	S	1-214-173-00	RES,METAL 51K 1% 1/4W
R257	S	1-214-128-00	RES,METAL 680 1% 1/4W
R258	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R259	S	1-214-143-00	RES,METAL 3K 1% 1/4W
R260	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
R261	S	1-214-180-00	RES,METAL 100K 1% 1/4W (Up to Serial No. 10126, and from 10201 to 10204)
	S	1-214-964-00	RES,METAL 1M 1% 1/4W (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
R262	S	1-214-172-00	RES,METAL 47K 1% 1/4W
R301, 302	S	1-215-493-00	RES,METAL 1M 1% 1/6W (Up to Serial No. 10126, and from 10201 to 10204)
	S	1-215-485-00	RES,METAL 470K 1% 1/6W (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
R303	S	1-247-894-00	RES,CARBON 430K 5% 1/6W (Up to Serial No. 10126, and from 10201 to 10204)
		1-215-493-00	RES,METAL 1M 1% 1/6W (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
R304	S	1-249-433-11	RES,CARBON 22K 5% 1/6W (Up to Serial No. 10126, and from 10201 to 10204)
	S	1-215-493-00	RES,METAL 1M 1% 1/6W (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
R305	S	1-249-433-11	RES,CARBON 22K 5% 1/6W (Only up to Serial No. 10126, and from 10201 to 10204)
R306	S	1-247-894-00	RES,CARBON 430K 5% 1/6W (Only up to Serial No. 10126, and from 10201 to 10204)
R307, 308	S	1-249-433-11	RES,CARBON 22K 5% 1/6W (Only up to Serial No. 10126, and from 10201 to 10204)
R309	S	1-247-894-00	RES,CARBON 430K 5% 1/6W (Only up to Serial No. 10126, and from 10201 to 10204)
R310, 311	S	1-249-433-11	RES,CARBON 22K 5% 1/6W (Only up to Serial No. 10126, and from 10201 to 10204)
R312	S	1-247-894-00	RES,CARBON 430K 5% 1/6W (Only up to Serial No. 10126, and from 10201 to 10204)
R313, 314	S	1-249-433-11	RES,CARBON 22K 5% 1/6W (Only up to Serial No. 10126, and from 10201 to 10204)

Ref.No. or Qty	SP	Part No.	Description
RA1	S	1-231-410-00	RESISTOR BLOCK 10K
RA2	S	1-231-410-00	RESISTOR BLOCK 10K
RV101	S	1-230-879-11	RES,VAR,CARBON 10K
RV102	S	1-226-583-00	RES,ADJ,CERMET 2K
RV103, 104	S	1-224-940-00	RES,ADJ,METAL 10K (Up to Serial No.10126, and from 10201 to 10204)
	S	1-226-278-00	RES,ADJ,METAL 20 (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
RV201	S	1-230-879-11	RES,VAR,CARBON 10K
RV202	S	1-226-583-00	RES,ADJ,CERMET 2K
RV203, 204	S	1-224-940-00	RES,ADJ,METAL 10K (Up to Serial No.10126, and from 10201 to 10204)
	S	1-226-278-00	RES,ADJ,METAL 20 (Serial No. 10205 and higher for J, U/C Serial No. 10127 and higher for AEP)
RY101	S	1-515-413-00	RELAY(SMALL SIGNAL)
RY102	S	1-515-464-00	RELAY
RY201	S	1-515-413-00	RELAY(SMALL SIGNAL)
RY202	S	1-515-464-00	RELAY
X1	S	1-567-184-00	VIBRATOR,CRYSTAL

Ref.No. or Qty	SP	Part No.	Description
ENC-2 BOARD			
1pc	O	A-7850-295-A	COMPLETE PCB,ENC-2 (This assembly includes the following parts.)
1pc	S	2-251-622-00	LEVER,PC BOARD
1pc	O	3-673-867-00	PLATE,INDICATION,PC BOARD
1pc	O	4-911-704-31	LABEL(ENC),PC BOARD
2pcs	S	7-626-317-21	PIN,SPRING 2.5x8
C1	S	1-123-306-00	CAP,ELECT 47 20% 10V
C2	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C3	S	1-131-347-00	CAP,TANT 1 20% 35V
C4	S	1-131-347-00	CAP,TANT 1 20% 35V
C5	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C6	S	1-102-106-00	CAP,CERAMIC 100P 10% 50V
C7	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C8	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C9	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C10	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C11	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C12	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C13	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C14	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C15	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C16	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C17	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C18	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C19	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C20	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C21	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C22	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C23	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C24	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C25	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C26	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C27	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C28	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C29	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C30	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C31	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C32	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C33	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C34	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C35	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C36	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C37	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C38	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C39	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C40	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C41	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C42	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C43	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C44	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C45	S	1-101-004-00	CAP,CERAMIC 0.01 50V
C46	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C47	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C48	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C49	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C50	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C51	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C52	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C53	S	1-131-449-11	CAP,TANT 3.3 20% 16V

Ref.No. or Qty	SP	Part No.	Description
D1	S	8-719-911-19	DIODE 1SS119
D2	S	8-719-911-19	DIODE 1SS119
D3	S	8-719-911-19	DIODE 1SS119
D4	S	8-719-911-19	DIODE 1SS119
D5	S	8-719-911-19	DIODE 1SS119
D6	S	8-719-911-19	DIODE 1SS119
D7	S	8-719-911-19	DIODE 1SS119
D8	S	8-719-911-19	DIODE 1SS119
D9	S	8-719-911-19	DIODE 1SS119
D10	S	8-719-911-19	DIODE 1SS119
IC1A	S	8-759-203-34	IC TC74HC368P
IC1B	S	8-759-202-22	IC TC74HC74P
IC1C	S	8-759-202-78	IC TC74HC51P
IC1D	S	8-759-202-22	IC TC74HC74P
IC1E	S	8-759-202-30	IC TC74HC161P
IC1F	S	8-759-202-14	IC TC74HC08P
IC1H	S	8-759-202-18	IC TC74HC20P
IC2B	S	8-759-004-63	IC MC74HC125N
IC2C	S	8-759-913-17	IC CX23021
IC2D	S	8-759-001-07	IC MC74HC10N
IC2E	S	8-759-202-30	IC TC74HC161P
IC2F	S	8-759-202-74	IC TC74HC04P
IC2H	S	8-759-202-18	IC TC74HC20P
IC2J	S	8-759-202-30	IC TC74HC161P
IC2K	S	8-759-202-30	IC TC74HC161P
IC3B	S	8-759-202-74	IC TC74HC04P
IC3C	S	8-759-202-11	IC TC74HC00P
IC3D	S	8-759-202-16	IC TC74HC11P
IC3E	S	8-759-202-30	IC TC74HC161P
IC3F	S	8-759-202-14	IC TC74HC08P
IC3H	S	8-759-001-07	IC MC74HC10N
IC3J	S	8-759-202-30	IC TC74HC161P
IC3K	S	8-759-202-30	IC TC74HC161P
IC4B	S	8-759-004-63	IC MC74HC125N
IC4C	S	8-759-202-22	IC TC74HC74P
IC4D	S	8-759-202-22	IC TC74HC74P
IC4E	S	8-759-202-93	IC TC74HC153P
IC4F	S	8-759-202-76	IC TC74HC30P
IC4H	S	8-759-202-22	IC TC74HC74P
IC4J	S	8-759-202-30	IC TC74HC161P
IC4K	S	8-759-202-30	IC TC74HC161P
IC5B	S	8-759-001-14	IC MC74HC58N
IC5C	S	8-759-202-22	IC TC74HC74P
IC5D	S	8-759-202-74	IC TC74HC04P
IC5E	S	8-759-202-24	IC TC74HC86P
IC5F	S	8-759-202-76	IC TC74HC30P
IC5H	S	8-759-202-22	IC TC74HC74P
IC5J	S	8-759-202-76	IC TC74HC30P
IC5K	S	8-759-202-76	IC TC74HC30P
IC6B	S	8-759-001-14	IC MC74HC58N
IC6C	S	8-759-202-30	IC TC74HC161P
IC6D	S	8-759-202-84	IC TC74HC109P
IC6E	S	8-759-203-07	IC TC74HC195P
IC6F	S	8-759-203-07	IC TC74HC195P
IC6H	S	8-759-202-27	IC TC74HC157P
IC6J	S	8-759-202-27	IC TC74HC157P
IC6K	S	8-759-202-27	IC TC74HC157P
IC7B	S	8-759-202-22	IC TC74HC74P
IC7C	S	8-759-001-02	IC MC74HC02N
IC7D	S	8-759-001-43	IC MC74HC175N
IC7E	S	8-759-001-39	IC MC74HC164N
IC7K	S	8-759-202-30	IC TC74HC161P
IC8B	S	8-759-202-74	IC TC74HC04P
IC8C	S	8-759-202-14	IC TC74HC08P
IC8D	S	8-759-001-07	IC MC74HC10N

Ref.No. or Qty	SP	Part No.	Description
IC8E	S	8-759-001-39	IC MC74HC164N
IC8F	S	8-759-202-33	IC TC74HC240P
IC8H	S	8-759-901-29	IC MSM5128-15RS
IC8K	S	8-759-202-30	IC TC74HC161P
IC9B	S	8-759-004-63	IC MC74HC125N
IC9D	S	8-759-202-86	IC TC74HC123P
IC9H	S	8-759-202-30	IC TC74HC161P
IC9J	S	8-759-202-11	IC TC74HC00P
IC9K	S	8-759-202-74	IC TC74HC04P
Q1	S	8-729-902-11	TRANSISTOR 2SC2021
Q2	S	8-729-902-11	TRANSISTOR 2SC2021
Q3	S	8-729-902-11	TRANSISTOR 2SC2021
Q4	S	8-729-902-11	TRANSISTOR 2SC2021
R1	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R2	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R3	S	1-214-149-00	RES,METAL 5.1K 1% 1/4W
R4	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R5	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R6	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R7	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R8	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R9	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R10	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R11	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R12	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R13	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R14	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R15	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R16	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R17	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R18	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R19	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R20	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R21	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R22	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R23	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R24	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R25	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R26	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R27	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R28	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R29	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R30	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R31	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R32	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R33	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R34	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R35	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R36	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R37	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R38	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R39	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R41	S	1-214-108-00	RES,METAL 100 1% 1/4W
R42	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R43	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R44	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R45	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R46	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R47	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R48	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R49	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R50	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R51	S	1-214-180-00	RES,METAL 100K 1% 1/4W

Ref.No. or Qty SP	Part No.	Description	Ref.No. or Qty SP	Part No.	Description
R52 S	1-214-132-00	RES,METAL 1K 1% 1/4W	C28 S	1-130-475-00	CAP,MYLAR 0.0022 5% 50V
R53 S	1-214-180-00	RES,METAL 100K 1% 1/4W	C29 S	1-131-449-11	CAP,TANT 3.3 20% 16V
R54 S	1-214-132-00	RES,METAL 1K 1% 1/4W	C30 S	1-102-963-00	CAP,CERAMIC 33P 5% 50V
R55 S	1-214-132-00	RES,METAL 1K 1% 1/4W	C31 S	1-102-963-00	CAP,CERAMIC 33P 5% 50V
R56 S	1-214-156-00	RES,METAL 10K 1% 1/4W	C32 S	1-102-963-00	CAP,CERAMIC 33P 5% 50V
R57 S	1-214-156-00	RES,METAL 10K 1% 1/4W	C33 S	1-102-963-00	CAP,CERAMIC 33P 5% 50V
R58 S	1-214-116-00	RES,METAL 220 1% 1/4W	C34 S	1-102-963-00	CAP,CERAMIC 33P 5% 50V
R59 S	1-214-116-00	RES,METAL 220 1% 1/4W	C35 S	1-130-471-00	CAP,MYLAR 0.001 5% 50V
R60 S	1-214-156-00	RES,METAL 10K 1% 1/4W	C36 S	1-131-371-00	CAP,TANT 10 20% 16V
R61 S	1-214-156-00	RES,METAL 10K 1% 1/4W	C37 S	1-123-332-00	CAP,ELECT 47 20% 25V
R62 S	1-214-116-00	RES,METAL 220 1% 1/4W	C38 S	1-101-004-00	CAP,CERAMIC 0.01 50V
R63 S	1-214-084-00	RES,METAL 10 1% 1/4W	C39 S	1-101-004-00	CAP,CERAMIC 0.01 50V
RB1 S	1-235-005-00	RESISTOR BLOCK 47K	C40 S	1-131-449-11	CAP,TANT 3.3 20% 16V
SW1 S	1-553-441-00	SWITCH,TOGGLE	C41 S	1-130-483-00	CAP,MYLAR 0.01 5% 50V
			C44 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C45 S	1-131-449-11	CAP,TANT 3.3 20% 16V
			C46 S	1-107-037-00	CAP,MICA 82P 5% 500V
			C47 S	1-107-171-00	CAP,MICA 120P 5% 500V
			C48 S	1-102-978-00	CAP,CERAMIC 220P 5% 50V
			C49 S	1-102-973-00	CAP,CERAMIC 100P 5% 50V
			C50 S	1-102-973-00	CAP,CERAMIC 100P 5% 50V
			C51 S	1-102-973-00	CAP,CERAMIC 100P 5% 50V
			C52 S	1-102-973-00	CAP,CERAMIC 100P 5% 50V
			C53 S	1-102-973-00	CAP,CERAMIC 100P 5% 50V
			C54 S	1-123-332-00	CAP,ELECT 47 20% 25V
			C55 S	1-123-332-00	CAP,ELECT 47 20% 25V
			C56 S	1-102-959-00	CAP,CERAMIC 22P 5% 50V
			C57 S	1-131-343-00	CAP,TANT 0.22 20% 35V
			C58 S	1-131-343-00	CAP,TANT 0.22 20% 35V
			C60 S	1-123-333-00	CAP,ELECT 100 20% 25V
			C62 S	1-123-332-00	CAP,ELECT 47 20% 25V
			C63 S	1-123-356-00	CAP,ELECT 10 20% 50V
			C64 S	1-131-449-11	CAP,TANT 3.3 20% 16V
			C65 S	1-123-356-00	CAP,ELECT 10 20% 50V
			C66 S	1-131-449-11	CAP,TANT 3.3 20% 16V
			C67 S	1-102-508-00	CAP,CERAMIC 10P 0.5P 50V
			C68 S	1-102-508-00	CAP,CERAMIC 10P 0.5P 50V
			C69 S	1-102-865-00	CAP,CERAMIC 8P 0.5P 50V
			C70 S	1-102-508-00	CAP,CERAMIC 10P 0.5P 50V
			C71 S	1-102-959-00	CAP,CERAMIC 22P 5% 50V
			C72 S	1-102-959-00	CAP,CERAMIC 22P 5% 50V
			C73 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C74 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C75 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C76 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C77 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C78 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C79 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C80 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C81 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C82 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C83 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C84 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C85 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C86 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C87 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C88 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C89 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C90 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C91 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C92 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C93 S	1-101-004-00	CAP,CERAMIC 0.01 50V
			C94 S	1-131-449-11	CAP,TANT 3.3 20% 16V
			C95 S	1-131-449-11	CAP,TANT 3.3 20% 16V
			C96 S	1-101-004-00	CAP,CERAMIC 0.01 50V
SIF-1 BOARD					
1pc O	A-7850-297-A	COMPLETE PCB,SIF-1			
(This assembly includes the following parts.)					
1pc S	2-251-622-00	LEVER,PC BOARD			
2pcs O	3-659-918-01	HEAT SINK,TR			
2pcs S	3-660-978-00	SHEET,HEAT RESISTING			
2pcs O	3-673-772-21	TERMINAL,TP			
1pc O	3-673-867-00	PLATE,INDICATION,PC BOARD			
1pc O	4-911-704-21	LABEL(SIF),PC BOARD			
1pc O	4-911-708-01	CASE(UPPER)(1),SHIELD,SIF			
1pc O	4-911-709-01	CASE(UPPER)(2),SHIELD,SIF			
2pcs O	4-911-710-01	CASE(LOWER),SHIELD,SIF			
2pcs S	7-626-317-21	PIN,SPRING 2.5x8			
7pcs S	7-682-547-04	SCREW,+B3x6			
5pcs S	7-684-023-04	NUT,M3			
C1 S	1-123-332-00	CAP,ELECT 47 20% 25V			
C2 S	1-123-332-00	CAP,ELECT 47 20% 25V			
C3 S	1-101-004-00	CAP,CERAMIC 0.01 50V			
C4 S	1-101-004-00	CAP,CERAMIC 0.01 50V			
C5 S	1-123-356-00	CAP,ELECT 10 20% 50V			
C6 S	1-131-449-11	CAP,TANT 3.3 20% 16V			
C7 S	1-123-356-00	CAP,ELECT 10 20% 50V			
C8 S	1-131-449-11	CAP,TANT 3.3 20% 16V			
C9 S	1-123-356-00	CAP,ELECT 10 20% 50V			
C10 S	1-131-449-11	CAP,TANT 3.3 20% 16V			
C11 S	1-101-004-00	CAP,CERAMIC 0.01 50V			
C12 S	1-131-449-11	CAP,TANT 3.3 20% 16V			
C13 S	1-136-162-00	CAP,FILM 0.056 5% 50V			
C14 S	1-130-481-00	CAP,MYLAR 0.0068 5% 50V			
C15 S	1-131-449-11	CAP,TANT 3.3 20% 16V			
C18 S	1-107-036-00	CAP,MICA 68P 5% 500V			
C19 S	1-107-169-00	CAP,MICA 100P 5% 500V			
C20 S	1-101-004-00	CAP,CERAMIC 0.01 50V			
C21 S	1-131-449-11	CAP,TANT 3.3 20% 16V			
C22 S	1-107-159-00	CAP,MICA 33P 5% 500V			
C23 S	1-101-004-00	CAP,CERAMIC 0.01 50V			
C24 S	1-101-004-00	CAP,CERAMIC 0.01 50V			
C25 S	1-101-004-00	CAP,CERAMIC 0.01 50V			
C26 S	1-123-356-00	CAP,ELECT 10 20% 50V			
C27 S	1-102-820-00	CAP,CERAMIC 330P 5% 50V			

Ref.No. or Qty	SP	Part No.	Description		Ref.No. or Qty	SP	Part No.	Description
C97	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D11	S	8-719-911-19	DIODE 1SS119
C98	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D12	S	8-719-911-19	DIODE 1SS119
C99	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D13	S	8-719-911-19	DIODE 1SS119
C100	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D14	S	8-719-911-19	DIODE 1SS119
C101	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D15	S	8-719-915-30	DIODE FC53M
C102	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D16	S	8-719-911-19	DIODE 1SS119
C103	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D17	S	8-719-911-19	DIODE 1SS119
C104	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D18	S	8-719-911-19	DIODE 1SS119
C105	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D19	S	8-719-911-19	DIODE 1SS119
C106	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D20	S	8-719-911-19	DIODE 1SS119
C107	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D21	S	8-719-911-19	DIODE 1SS119
C108	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D22	S	8-719-911-19	DIODE 1SS119
C109	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D23	S	8-719-911-19	DIODE 1SS119
C110	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D24	S	8-719-911-19	DIODE 1SS119
C111	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D25	S	8-719-911-19	DIODE 1SS119
C112	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D26	S	8-719-911-19	DIODE 1SS119
C113	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D27	S	8-719-911-19	DIODE 1SS119
C114	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D28	S	8-719-911-19	DIODE 1SS119
C115	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D29	S	8-719-911-19	DIODE 1SS119
C116	S	1-131-449-11	CAP,TANT 3.3	20% 16V	D30	S	8-719-911-19	DIODE 1SS119
C117	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D31	S	8-719-911-19	DIODE 1SS119
C118	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D32	S	8-719-911-19	DIODE 1SS119
C119	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D33	S	8-719-911-19	DIODE 1SS119
C120	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D34	S	8-719-911-19	DIODE 1SS119
C121	S	1-101-004-00	CAP,CERAMIC 0.01	50V	D35	S	8-719-101-97	DIODE 1SS97-1
C122	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1E	S	8-759-202-16	IC TC74HC11P
C123	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1F	S	8-759-001-38	IC MC74HC163N
C124	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1H	S	8-759-201-34	IC TD62503P
C125	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1J	S	8-759-001-27	IC MC74HC113N
C126	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC1K	S	8-759-001-38	IC MC74HC163N
C127	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2C	S	8-759-907-35	IC UA733DC
C128	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2D	S	8-759-001-38	IC MC74HC163N
C129	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2E	S	8-759-202-30	IC TC74HC161P
C130	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2F	S	8-759-001-38	IC MC74HC163N
C131	S	1-131-449-11	CAP,TANT 3.3	20% 16V	IC2H	S	8-759-202-14	IC TC74HC08P
C132	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2J	S	8-759-202-22	IC TC74HC74P
C133	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2K	S	8-759-202-22	IC TC74HC74P
C134	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC2L	S	8-759-905-29	IC NE529N
C135	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3D	S	8-759-202-74	IC TC74HC04P
C136	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3E	S	8-759-202-30	IC TC74HC161P
C137	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3F	S	8-759-001-38	IC MC74HC163N
C138	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3H	S	8-759-202-22	IC TC74HC74P
C139	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3J	S	8-759-202-86	IC TC74HC123P
C140	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3K	S	8-759-202-11	IC TC74HC00P
C141	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC3N	S	8-759-040-44	IC MC4044P
C142	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC4B	S	8-759-951-24	IC SN75124N
C143	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC4C	S	8-759-202-55	IC TC74HC244P
C144	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC4D	S	8-759-202-11	IC TC74HC00P
C145	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC4E	S	8-759-202-22	IC TC74HC74P
C146	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC4F	S	8-759-001-38	IC MC74HC163N
C147	S	1-131-449-11	CAP,TANT 3.3	20% 16V	IC4H	S	8-759-202-74	IC TC74HC04P
C148	S	1-101-004-00	CAP,CERAMIC 0.01	50V	IC4J	S	8-759-203-08	IC TC74HC221P
C149	S	1-131-449-11	CAP,TANT 3.3	20% 16V	IC4K	S	8-759-202-11	IC TC74HC00P
CV1	S	1-141-293-11	CAP,TRIMMER		IC4L	S	8-759-004-63	IC MC74HC125N
CV2	S	1-141-293-11	CAP,TRIMMER		IC4M	S	8-759-202-11	IC TC74HC00P
D1	S	8-719-911-19	DIODE 1SS119		IC4N	S	8-759-202-22	IC TC74HC74P
D2	S	8-719-911-19	DIODE 1SS119		IC5B	S	8-759-951-24	IC SN75124N
D3	S	8-719-911-19	DIODE 1SS119		IC5C	S	8-759-951-21	IC SN75121N
D4	S	8-719-911-19	DIODE 1SS119		IC5D	S	8-759-202-14	IC TC74HC08P
D5	S	8-719-911-19	DIODE 1SS119		IC5E	S	8-759-202-11	IC TC74HC00P
D6	S	8-719-915-43	DIODE FC54M		IC5F	S	8-759-202-74	IC TC74HC04P
D7	S	8-719-911-19	DIODE 1SS119		IC5H	S	8-759-202-55	IC TC74HC244P
D8	S	8-719-911-19	DIODE 1SS119		IC5K	S	8-759-202-14	IC TC74HC08P
D9	S	8-719-911-19	DIODE 1SS119		IC5L	S	8-759-001-38	IC MC74HC163N
D10	S	8-719-911-19	DIODE 1SS119		IC5M	S	8-759-001-38	IC MC74HC163N

Ref.No. or Qty	SP	Part No.	Description	Ref.No. or Qty	SP	Part No.	Description
IC5N	S	8-759-202-11	IC TC74HC00P	R16	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
IC6B	S	8-759-202-55	IC TC74HC244P	R17	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
IC6H	S	8-759-202-22	IC TC74HC74P	R18	S	1-214-156-00	RES,METAL 10K 1% 1/4W
IC6J	S	8-759-004-63	IC MC74HC125N	R19	S	1-214-144-00	RES,METAL 3.3K 1% 1/4W
IC6K	S	8-759-202-11	IC TC74HC00P	R20	S	1-214-164-00	RES,METAL 22K 1% 1/4W
IC6L	S	8-759-001-38	IC MC74HC163N	R21	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC6N	S	8-759-220-00	IC TC40H000P	R22	S	1-214-166-00	RES,METAL 27K 1% 1/4W
IC7B	S	8-759-951-21	IC SN75121N	R23	S	1-214-149-00	RES,METAL 5.1K 1% 1/4W
IC7D	S	8-759-920-45	IC CX23070	R24	S	1-214-149-00	RES,METAL 5.1K 1% 1/4W
IC7F	S	8-759-920-45	IC CX23070	R25	S	1-215-493-00	RES,METAL 1M 1% 1/6W
IC7H	S	8-757-732-00	IC CX-773B	R26	S	1-215-493-00	RES,METAL 1M 1% 1/6W
IC7K	S	8-757-903-00	IC CX-7903	R27	S	1-214-100-00	RES,METAL 47 1% 1/4W
IC7M	S	8-759-220-00	IC TC40H000P	R28	S	1-214-105-00	RES,METAL 75 1% 1/4W
IC7N	S	8-759-202-11	IC TC74HC00P	R29	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC8B	S	8-759-951-21	IC SN75121N	R30	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC8H	S	8-759-202-21	IC TC74HC32P	R31	S	1-214-156-00	RES,METAL 10K 1% 1/4W
IC8J	S	8-759-001-38	IC MC74HC163N	R32	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC8K	S	8-759-202-22	IC TC74HC74P	R33	S	1-214-100-00	RES,METAL 47 1% 1/4W
IC9A	S	8-759-202-55	IC TC74HC244P	R34	S	1-214-105-00	RES,METAL 75 1% 1/4W
IC9B	S	8-759-202-22	IC TC74HC74P	R35	S	1-214-100-00	RES,METAL 47 1% 1/4W
IC9D	S	8-759-920-45	IC CX23070	R36	S	1-214-105-00	RES,METAL 75 1% 1/4W
IC9F	S	8-759-920-45	IC CX23070	R37	S	1-214-100-00	RES,METAL 47 1% 1/4W
IC9H	S	8-759-202-22	IC TC74HC74P	R38	S	1-214-105-00	RES,METAL 75 1% 1/4W
IC9J	S	8-759-001-38	IC MC74HC163N	R39	S	1-214-100-00	RES,METAL 47 1% 1/4W
IC9K	S	8-759-202-74	IC TC74HC04P	R40	S	1-214-105-00	RES,METAL 75 1% 1/4W
IC9N	S	8-759-040-44	IC MC4044P	R41	S	1-214-144-00	RES,METAL 3.3K 1% 1/4W
L1	S	1-409-339-00	COIL,SN	R42	S	1-214-180-00	RES,METAL 100K 1% 1/4W
L2	S	1-409-339-00	COIL,SN	R43	S	1-214-156-00	RES,METAL 10K 1% 1/4W
L3	S	1-408-564-00	INDUCTOR,MICRO 12 10%	R44	S	1-214-132-00	RES,METAL 1K 1% 1/4W
L5	S	1-407-690-00	INDUCTOR,MICRO 5.6 10%	R45	S	1-214-100-00	RES,METAL 47 1% 1/4W
Q1	S	8-759-700-11	IC NJM78M05A	R46	S	1-214-100-00	RES,METAL 47 1% 1/4W
Q2	S	8-759-700-11	IC NJM78M05A	R47	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q3	S	8-759-700-20	IC NJM79M05A	R48	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q4	S	8-729-178-54	TRANSISTOR 2SC2785	R49	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q5	S	8-729-178-54	TRANSISTOR 2SC2785	R50	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q6	S	8-729-124-08	TRANSISTOR 2SC2408	R51	S	1-214-156-00	RES,METAL 10K 1% 1/4W
Q7	S	8-729-124-08	TRANSISTOR 2SC2408	R52	S	1-214-156-00	RES,METAL 10K 1% 1/4W
Q8	S	8-729-124-08	TRANSISTOR 2SC2408	R53	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q9	S	8-729-124-08	TRANSISTOR 2SC2408	R54	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q10	S	8-729-124-08	TRANSISTOR 2SC2408	R55	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q11	S	8-729-124-08	TRANSISTOR 2SC2408	R56	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q12	S	8-729-124-08	TRANSISTOR 2SC2408	R57	S	1-214-156-00	RES,METAL 10K 1% 1/4W
Q13	S	8-729-190-12	TRANSISTOR 2SC2901	R58	S	1-214-156-00	RES,METAL 10K 1% 1/4W
Q14	S	8-729-124-08	TRANSISTOR 2SC2408	R59	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q15	S	8-729-200-43	TRANSISTOR 2SA1048L	R60	S	1-214-132-00	RES,METAL 1K 1% 1/4W
Q16	S	8-729-169-02	TRANSISTOR 2SC2690A	R61	S	1-214-156-00	RES,METAL 10K 1% 1/4W
Q17	S	8-729-122-02	TRANSISTOR 2SA1220A	R62	S	1-214-173-00	RES,METAL 51K 1% 1/4W
Q18	S	8-729-306-92	TRANSISTOR 2SD669A	R63	S	1-214-139-00	RES,METAL 2K 1% 1/4W
Q19	S	8-729-306-92	TRANSISTOR 2SD669A	R64	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
Q20	S	8-759-700-12	IC NJM78M06A	R65	S	1-214-156-00	RES,METAL 10K 1% 1/4W
Q21	S	8-759-700-21	IC NJM79M06A	R66	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R1	S	1-217-217-11	RES,WIRE 27 10% 2W	R67	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R2	S	1-217-217-11	RES,WIRE 27 10% 2W	R68	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R3	S	1-214-168-00	RES,METAL 33K 1% 1/4W	R69	S	1-214-149-00	RES,METAL 5.1K 1% 1/4W
R4	S	1-214-132-00	RES,METAL 1K 1% 1/4W	R70	S	1-214-113-00	RES,METAL 160 1% 1/4W
R5	S	1-214-132-00	RES,METAL 1K 1% 1/4W	R71	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R6	S	1-214-174-00	RES,METAL 56K 1% 1/4W	R72	S	1-214-161-00	RES,METAL 16K 1% 1/4W
R7	S	1-214-121-00	RES,METAL 360 1% 1/4W	R73	S	1-214-168-00	RES,METAL 33K 1% 1/4W
R8	S	1-214-113-00	RES,METAL 160 1% 1/4W	R74	S	1-214-176-00	RES,METAL 68K 1% 1/4W
R9	S	1-214-180-00	RES,METAL 100K 1% 1/4W	R75	S	1-214-108-00	RES,METAL 100 1% 1/4W
R10	S	1-214-161-00	RES,METAL 16K 1% 1/4W	R76	S	1-214-125-00	RES,METAL 510 1% 1/4W
R11	S	1-214-168-00	RES,METAL 33K 1% 1/4W	R77	S	1-214-108-00	RES,METAL 100 1% 1/4W
R12	S	1-214-108-00	RES,METAL 100 1% 1/4W	R78	S	1-214-126-00	RES,METAL 560 1% 1/4W
R13	S	1-214-173-00	RES,METAL 51K 1% 1/4W	R79	S	1-214-108-00	RES,METAL 100 1% 1/4W
R14	S	1-214-125-00	RES,METAL 510 1% 1/4W	R80	S	1-214-173-00	RES,METAL 51K 1% 1/4W
R15	S	1-214-146-00	RES,METAL 3.9K 1% 1/4W				

Ref.No. or Qty	SP	Part No.	Description
R81	S	1-214-174-00	RES, METAL 56K 1% 1/4W
R82	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R83	S	1-249-455-11	RES, CARBON 4.7 5% 1/4W
R84	S	1-214-140-00	RES, METAL 2.2K 1% 1/4W
R85	S	1-214-140-00	RES, METAL 2.2K 1% 1/4W
R86	S	1-249-455-11	RES, CARBON 4.7 5% 1/4W
R87	S	1-214-140-00	RES, METAL 2.2K 1% 1/4W
R88	S	1-249-455-11	RES, CARBON 4.7 5% 1/4W
R89	S	1-214-140-00	RES, METAL 2.2K 1% 1/4W
R90	S	1-249-455-11	RES, CARBON 4.7 5% 1/4W
R91	S	1-214-140-00	RES, METAL 2.2K 1% 1/4W
R92	S	1-249-455-11	RES, CARBON 4.7 5% 1/4W
R93	S	1-214-116-00	RES, METAL 220 1% 1/4W
R94	S	1-214-116-00	RES, METAL 220 1% 1/4W
R95	S	1-214-116-00	RES, METAL 220 1% 1/4W
R96	S	1-214-116-00	RES, METAL 220 1% 1/4W
R97	S	1-214-136-00	RES, METAL 1.5K 1% 1/4W
R98	S	1-214-139-00	RES, METAL 2K 1% 1/4W
R99	S	1-214-133-00	RES, METAL 1.1K 1% 1/4W
R100	S	1-214-161-00	RES, METAL 16K 1% 1/4W
R101	S	1-214-172-00	RES, METAL 47K 1% 1/4W
R102	S	1-214-128-00	RES, METAL 680 1% 1/4W
R103	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R104	S	1-214-141-00	RES, METAL 2.4K 1% 1/4W
R105	S	1-214-105-00	RES, METAL 75 1% 1/4W
R106	S	1-214-105-00	RES, METAL 75 1% 1/4W
R107	S	1-214-146-00	RES, METAL 3.9K 1% 1/4W
R108	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R109	S	1-214-140-00	RES, METAL 2.2K 1% 1/4W
R110	S	1-214-140-00	RES, METAL 2.2K 1% 1/4W
R111	S	1-214-144-00	RES, METAL 3.3K 1% 1/4W
R112	S	1-214-144-00	RES, METAL 3.3K 1% 1/4W
R113	S	1-214-144-00	RES, METAL 3.3K 1% 1/4W
R114	S	1-214-108-00	RES, METAL 100 1% 1/4W
R115	S	1-214-148-00	RES, METAL 4.7K 1% 1/4W
R116	S	1-214-140-00	RES, METAL 2.2K 1% 1/4W
R117	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R118	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R119	S	1-247-211-00	RES, CARBON 62 5% 1/2W
R120	S	1-247-211-00	RES, CARBON 62 5% 1/2W
R121	S	1-214-105-00	RES, METAL 75 1% 1/4W
R122	S	1-214-105-00	RES, METAL 75 1% 1/4W
R123	S	1-214-105-00	RES, METAL 75 1% 1/4W
R124	S	1-214-105-00	RES, METAL 75 1% 1/4W
R125	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R200	S	1-215-469-00	RES, METAL 100K 1% 1/6W
(Serial No. 12801 and higher)			
RB1	S	1-231-410-00	RESISTOR BLOCK 10K
RV1	S	1-224-937-00	RES, ADJ, METAL 1K
RV2	S	1-228-763-00	RES, ADJ, CERMET 5K
RV3	S	1-224-940-00	RES, ADJ, METAL 10K
RV4	S	1-224-940-00	RES, ADJ, METAL 10K
SW1	S	1-553-441-00	SWITCH, TOGGLE
X1	S	1-567-517-11	OSCILLATOR, 14.34MHZ
X2	S	1-567-475-11	VIBRATOR, CRYSTAL
X3	S	1-567-025-00	VIBRATOR, CRYSTAL
X4	S	1-567-514-11	OSCILLATOR, 11.3MHZ

Ref.No. or Qty	SP	Part No.	Description
DEC-15 BOARD			
lpc	O	A-7850-299-A	COMPLETE PCB, DEC-15
(This assembly includes the following parts.)			
lpc	S	2-251-622-00	LEVER, PC BOARD
lpc	O	3-673-867-00	PLATE, INDICATION, PC BOARD
lpc	O	4-911-704-11	LABEL (DEC), PC BOARD
2pcs	S	7-626-317-21	PIN, SPRING 2.5x8
C1	S	1-123-332-00	CAP, ELECT 47 20% 25V
C2	S	1-123-332-00	CAP, ELECT 47 20% 25V
C3	S	1-101-004-00	CAP, CERAMIC 0.01 50V
C4	S	1-101-004-00	CAP, CERAMIC 0.01 50V
C5	S	1-123-306-00	CAP, ELECT 47 20% 10V
C6	S	1-101-004-00	CAP, CERAMIC 0.01 50V
C7	S	1-123-356-00	CAP, ELECT 10 20% 50V
C8	S	1-123-356-00	CAP, ELECT 10 20% 50V
C9	S	1-123-333-00	CAP, ELECT 100 20% 25V
C10	S	1-123-333-00	CAP, ELECT 100 20% 25V
C11	S	1-102-951-00	CAP, CERAMIC 15P 5% 50V
C12	S	1-123-333-00	CAP, ELECT 100 20% 25V
C13	S	1-136-149-00	CAP, MYLAR 0.0047 5% 50V
C14	S	1-101-004-00	CAP, CERAMIC 0.01 50V
C15	S	1-102-958-00	CAP, CERAMIC 20P 5% 50V
C16	S	1-102-958-00	CAP, CERAMIC 20P 5% 50V
C17	S	1-131-344-00	CAP, TANT 0.33 10% 35V
C18	S	1-102-951-00	CAP, CERAMIC 15P 5% 50V
C19	S	1-136-153-00	CAP, MYLAR 0.01 5% 50V
C20	S	1-136-157-00	CAP, MYLAR 0.022 5% 50V
C21	S	1-131-449-11	CAP, TANT 3.3 20% 16V
C22	S	1-131-449-11	CAP, TANT 3.3 20% 16V
C23	S	1-131-449-11	CAP, TANT 3.3 20% 16V
C24	S	1-131-449-11	CAP, TANT 3.3 20% 16V
C25	S	1-101-884-00	CAP, CERAMIC 56P 5% 50V
C26	S	1-101-888-00	CAP, CERAMIC 68P 5% 50V
C27	S	1-123-356-00	CAP, ELECT 10 20% 50V
C28	S	1-131-379-00	CAP, TANT 22 10% 10V
C29	S	1-131-347-00	CAP, TANT 1 20% 35V
C30	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C31	S	1-101-001-00	CAP, CERAMIC 0.001 50V
C32	S	1-101-001-00	CAP, CERAMIC 0.001 50V
C33	S	1-101-001-00	CAP, CERAMIC 0.001 50V
C34	S	1-131-376-00	CAP, TANT 6.8 10% 10V
C35	S	1-131-377-00	CAP, TANT 10 10% 10V
C36	S	1-131-377-00	CAP, TANT 10 10% 10V
C37	S	1-131-377-00	CAP, TANT 10 10% 10V
C38	S	1-131-377-00	CAP, TANT 10 10% 10V
C39	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C40	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C41	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C42	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C43	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C44	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C45	S	1-131-449-11	CAP, TANT 3.3 20% 16V
C46	S	1-131-449-11	CAP, TANT 3.3 20% 16V
C47	S	1-101-004-00	CAP, CERAMIC 0.01 50V
C48	S	1-101-004-00	CAP, CERAMIC 0.01 50V
C49	S	1-101-004-00	CAP, CERAMIC 0.01 50V
C50	S	1-101-004-00	CAP, CERAMIC 0.01 50V
C51	S	1-123-356-00	CAP, ELECT 10 20% 50V
C52	S	1-123-356-00	CAP, ELECT 10 20% 50V
C53	S	1-123-356-00	CAP, ELECT 10 20% 50V
C54	S	1-123-356-00	CAP, ELECT 10 20% 50V
C55	S	1-101-004-00	CAP, CERAMIC 0.01 50V
C56	S	1-101-004-00	CAP, CERAMIC 0.01 50V
C57	S	1-101-004-00	CAP, CERAMIC 0.01 50V
C58	S	1-101-004-00	CAP, CERAMIC 0.01 50V
C59	S	1-101-004-00	CAP, CERAMIC 0.01 50V
C60	S	1-101-004-00	CAP, CERAMIC 0.01 50V

Ref.No. or Qty SP	Part No.	Description			Ref.No. or Qty SP	Part No.	Description		
C61	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D11	S	8-719-911-19	DIODE 1SS119
C62	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D12	S	8-719-911-19	DIODE 1SS119
C63	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D13	S	8-719-911-19	DIODE 1SS119
C64	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D14	S	8-719-911-19	DIODE 1SS119
C65	S	1-131-449-11	CAP,TANT	3.3	20% 16V	D15	S	8-719-911-19	DIODE 1SS119
C66	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D16	S	8-719-911-19	DIODE 1SS119
C67	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D17	S	8-719-911-19	DIODE 1SS119
C68	S	1-123-356-00	CAP,ELECT	10	20% 50V	D18	S	8-719-911-19	DIODE 1SS119
C69	S	1-123-356-00	CAP,ELECT	10	20% 50V	D19	S	8-719-911-19	DIODE 1SS119
C70	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D20	S	8-719-911-19	DIODE 1SS119
C71	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D21	S	8-719-911-19	DIODE 1SS119
C72	S	1-131-449-11	CAP,TANT	3.3	20% 16V	D22	S	8-719-911-19	DIODE 1SS119
C73	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D23	S	8-719-911-19	DIODE 1SS119
C74	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D24	S	8-719-911-19	DIODE 1SS119
C75	S	1-123-356-00	CAP,ELECT	10	20% 50V	D25	S	8-719-911-19	DIODE 1SS119
C76	S	1-123-356-00	CAP,ELECT	10	20% 50V	D26	S	8-719-911-19	DIODE 1SS119
C77	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D27	S	8-719-911-19	DIODE 1SS119
C78	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D28	S	8-719-903-43	DIODE PR3432S
C79	S	1-102-106-00	CAP,CERAMIC	100P	10% 50V	D29	S	8-719-903-43	DIODE PR3432S
C80	S	1-131-449-11	CAP,TANT	3.3	20% 16V	D30	S	8-719-903-43	DIODE PR3432S
C81	S	1-131-449-11	CAP,TANT	3.3	20% 16V	D31	S	8-719-903-43	DIODE PR3432S
C82	S	1-131-449-11	CAP,TANT	3.3	20% 16V	D32	S	8-719-914-32	DIODE PG3432S
C83	S	1-131-449-11	CAP,TANT	3.3	20% 16V	D33	S	8-719-934-33	DIODE PY3432S
C84	S	1-131-449-11	CAP,TANT	3.3	20% 16V	D34	S	8-719-903-43	DIODE PR3432S
C85	S	1-131-449-11	CAP,TANT	3.3	20% 16V	D35	S	8-719-903-43	DIODE PR3432S
C86	S	1-131-449-11	CAP,TANT	3.3	20% 16V	D36	S	8-719-911-19	DIODE 1SS119
C87	S	1-131-449-11	CAP,TANT	3.3	20% 16V	D37	S	8-719-911-19	DIODE 1SS119
C88	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D38	S	8-719-911-19	DIODE 1SS119
C89	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D39	S	8-719-911-19	DIODE 1SS119
C90	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D40	S	8-719-911-19	DIODE 1SS119
C91	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D41	S	8-719-911-19	DIODE 1SS119
C92	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D42	S	8-719-911-19	DIODE 1SS119
C93	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D43	S	8-719-911-19	DIODE 1SS119
C94	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D44	S	8-719-911-19	DIODE 1SS119
C95	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D45	S	8-719-911-19	DIODE 1SS119
C96	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D46	S	8-719-911-19	DIODE 1SS119
C97	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D47	S	8-719-911-19	DIODE 1SS119
C98	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D48	S	8-719-911-19	DIODE 1SS119
C99	S	1-101-004-00	CAP,CERAMIC	0.01	50V	D49	S	8-719-911-19	DIODE 1SS119
C100	S	1-101-004-00	CAP,CERAMIC	0.01	50V	DL1	S	1-415-168-00	DELAY LINE
C101	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC1C	S	8-759-174-11	IC UPC741C
C102	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC1E	S	8-759-905-29	IC NE529N
C103	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC1H	S	8-759-174-11	IC UPC741C
C104	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC1J	S	8-759-174-11	IC UPC741C
C105	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC1K	S	8-759-240-53	IC TC4053BP
C106	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC1L	S	8-759-001-43	IC MC74HC175N
C107	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC1M	S	8-759-202-74	IC TC74HCO4P
C108	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC2B	S	8-759-240-53	IC TC4053BP
C109	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC2C	S	8-759-925-25	IC HA7-2525-5
C110	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC2E	S	8-759-905-29	IC NE529N
C111	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC2H	S	8-759-131-11	IC UPC311C
C112	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC2J	S	8-759-174-11	IC UPC741C
C113	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC2L	S	8-759-004-63	IC MC74HC125N
C114	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC2M	S	8-759-001-38	IC MC74HC163N
C115	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC2N	S	8-759-202-24	IC TC74HC86P
C116	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC3A	S	8-759-202-55	IC TC74HC244P
C117	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC3B	S	8-759-925-25	IC HA7-2525-5
D1	S	8-719-911-19	DIODE 1SS119			IC3C	S	8-759-925-25	IC HA7-2525-5
D2	S	8-719-911-19	DIODE 1SS119			IC3D	S	8-759-131-11	IC UPC311C
D3	S	8-719-911-19	DIODE 1SS119			IC3E	S	8-759-131-11	IC UPC311C
D4	S	8-719-911-19	DIODE 1SS119			IC3K	S	8-759-240-53	IC TC4053BP
D5	S	8-719-100-29	DIODE RD5.1EB1			IC3L	S	8-759-202-74	IC TC74HCO4P
D6	S	8-719-100-29	DIODE RD5.1EB1			IC3M	S	8-759-202-14	IC TC74HCO8P
D7	S	8-719-911-19	DIODE 1SS119			IC3N	S	8-759-202-22	IC TC74HC74P
D8	S	8-719-911-19	DIODE 1SS119			IC4K	S	8-759-240-53	IC TC4053BP
D9	S	8-719-911-19	DIODE 1SS119						
D10	S	8-719-911-19	DIODE 1SS119						

Ref.No. or Qty	SP	Part No.	Description
IC4L	S	8-759-004-63	IC MC74HC125N
IC4M	S	8-759-001-07	IC MC74HC10N
IC4N	S	8-759-202-86	IC TC74HC123P
IC5B	S	8-759-201-34	IC TD62503P
IC5C	S	8-759-202-74	IC TC74HC04P
IC5D	S	8-759-202-27	IC TC74HC157P
IC5K	S	8-759-901-29	IC MSM5128-15RS
IC6A	S	8-759-202-55	IC TC74HC244P
IC6B	S	8-759-202-74	IC TC74HC04P
IC6C	S	8-759-202-22	IC TC74HC74P
IC6D	S	8-759-202-11	IC TC74HC00P
IC6F	S	8-759-920-47	IC CX23072
IC6M	S	8-759-001-31	IC MC74HC151N
IC6N	S	8-759-201-34	IC TD62503P
IC7A	S	8-759-202-55	IC TC74HC244P
IC7B	S	8-759-004-63	IC MC74HC125N
IC7C	S	8-759-202-22	IC TC74HC74P
IC7D	S	8-759-202-11	IC TC74HC00P
IC7E	S	8-759-202-74	IC TC74HC04P
IC7H	S	8-759-920-46	IC CX23071
IC7K	S	8-759-901-29	IC MSM5128-15RS
IC7L	S	8-759-300-54	IC HM6148HP-45
IC7M	S	8-759-202-86	IC TC74HC123P
IC7N	S	8-759-202-86	IC TC74HC123P
IC8B	S	8-759-201-34	IC TD62503P
IC8C	S	8-759-202-11	IC TC74HC00P
IC8D	S	8-759-202-74	IC TC74HC04P
IC8E	S	8-759-001-07	IC MC74HC10N
IC8F	S	8-759-001-39	IC MC74HC164N
IC9C	S	(Serial No. 12201 and higher) 8-759-202-74	IC TC74HC04P
IC9D	S	8-759-202-22	IC TC74HC74P
IC9E	S	8-759-202-86	IC TC74HC123P
IC9K	S	8-759-920-49	IC CX23074
IC9M	S	8-759-972-60	IC CX23073B
L1	S	1-409-339-00	COIL, SN
L2	S	1-409-339-00	COIL, SN
Q1	S	8-729-105-75	TRANSISTOR 2SK523
Q2	S	8-729-902-11	TRANSISTOR 2SC2021
Q3	S	8-729-993-72	TRANSISTOR 2SA937
Q4	S	8-729-902-11	TRANSISTOR 2SC2021
Q5	S	8-729-902-11	TRANSISTOR 2SC2021
R1	S	1-214-121-00	RES, METAL 360 1% 1/4W
R2	S	1-214-121-00	RES, METAL 360 1% 1/4W
R3	S	1-214-105-00	RES, METAL 75 1% 1/4W
R4	S	1-214-105-00	RES, METAL 75 1% 1/4W
R5	S	1-214-108-00	RES, METAL 100 1% 1/4W
R6	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R7	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R8	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R9	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R10	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R11	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R12	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R13	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R14	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R15	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R16	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R17	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R18	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R19	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R20	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R21	S	1-214-108-00	RES, METAL 100 1% 1/4W
R22	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R23	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R24	S	1-214-161-00	RES, METAL 16K 1% 1/4W
R25	S	1-214-164-00	RES, METAL 22K 1% 1/4W

Ref.No. or Qty	SP	Part No.	Description
R26	S	1-214-108-00	RES, METAL 100 1% 1/4W
R27	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R28	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R29	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R30	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R31	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R32	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R33	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R34	S	1-214-147-00	RES, METAL 4.3K 1% 1/4W
R35	S	1-214-147-00	RES, METAL 4.3K 1% 1/4W
R36	S	1-214-147-00	RES, METAL 4.3K 1% 1/4W
R37	S	1-214-150-00	RES, METAL 5.6K 1% 1/4W
R38	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R39	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R40	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R41	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R42	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R43	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R44	S	1-214-161-00	RES, METAL 16K 1% 1/4W
R45	S	1-214-164-00	RES, METAL 22K 1% 1/4W
R46	S	1-214-124-00	RES, METAL 470 1% 1/4W
R47	S	1-214-150-00	RES, METAL 5.6K 1% 1/4W
R48	S	1-214-157-00	RES, METAL 11K 1% 1/4W
R49	S	1-214-144-00	RES, METAL 3.3K 1% 1/4W
R50	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R51	S	1-214-180-00	RES, METAL 100K 1% 1/4W
R52	S	1-214-155-00	RES, METAL 9.1K 1% 1/4W
R53	S	1-214-126-00	RES, METAL 560 1% 1/4W
R54	S	1-214-144-00	RES, METAL 3.3K 1% 1/4W
R55	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R56	S	1-214-164-00	RES, METAL 22K 1% 1/4W
R57	S	1-214-164-00	RES, METAL 22K 1% 1/4W
R58	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R59	S	1-214-108-00	RES, METAL 100 1% 1/4W
R60	S	1-214-164-00	RES, METAL 22K 1% 1/4W
R61	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R62	S	1-214-180-00	RES, METAL 100K 1% 1/4W
R63	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R64	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R65	S	1-214-163-00	RES, METAL 20K 1% 1/4W
R66	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R67	S	1-214-180-00	RES, METAL 100K 1% 1/4W
R68	S	1-214-163-00	RES, METAL 20K 1% 1/4W
R69	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R70	S	1-214-163-00	RES, METAL 20K 1% 1/4W
R71	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R72	S	1-214-163-00	RES, METAL 20K 1% 1/4W
R73	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R74	S	1-214-163-00	RES, METAL 20K 1% 1/4W
R75	S	1-214-163-00	RES, METAL 20K 1% 1/4W
R76	S	1-214-137-00	RES, METAL 1.6K 1% 1/4W
R77	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R78	S	1-214-144-00	RES, METAL 3.3K 1% 1/4W
R79	S	1-214-132-00	RES, METAL 1K 1% 1/4W
R80	S	1-214-163-00	RES, METAL 20K 1% 1/4W
R81	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R82	S	1-214-163-00	RES, METAL 20K 1% 1/4W
R83	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R84	S	1-214-163-00	RES, METAL 20K 1% 1/4W
R85	S	1-214-156-00	RES, METAL 10K 1% 1/4W
R86	S	1-214-163-00	RES, METAL 20K 1% 1/4W
R87	S	1-214-163-00	RES, METAL 20K 1% 1/4W
R88	S	1-214-136-00	RES, METAL 1.5K 1% 1/4W
R89	S	1-214-136-00	RES, METAL 1.5K 1% 1/4W
R90	S	1-214-136-00	RES, METAL 1.5K 1% 1/4W

Ref.No. or Qty	SP	Part No.	Description
R91	S	1-214-134-00	RES,METAL 1.2K 1% 1/4W
R92	S	1-214-134-00	RES,METAL 1.2K 1% 1/4W
R93	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R94	S	1-214-124-00	RES,METAL 470 1% 1/4W
R95	S	1-214-124-00	RES,METAL 470 1% 1/4W
R96	S	1-214-124-00	RES,METAL 470 1% 1/4W
R97	S	1-214-124-00	RES,METAL 470 1% 1/4W
R98	S	1-214-116-00	RES,METAL 220 1% 1/4W
R99	S	1-214-116-00	RES,METAL 220 1% 1/4W
R100	S	1-214-116-00	RES,METAL 220 1% 1/4W
R101	S	1-214-167-00	RES,METAL 30K 1% 1/4W
R102	S	1-214-167-00	RES,METAL 30K 1% 1/4W
R103	S	1-214-167-00	RES,METAL 30K 1% 1/4W
R104	S	1-214-167-00	RES,METAL 30K 1% 1/4W
R105	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R106	S	1-214-116-00	RES,METAL 220 1% 1/4W
R107	S	1-214-116-00	RES,METAL 220 1% 1/4W
R108	S	1-214-119-00	RES,METAL 300 1% 1/4W
R109	S	1-214-119-00	RES,METAL 300 1% 1/4W
R110	S	1-214-119-00	RES,METAL 300 1% 1/4W
R111	S	1-214-119-00	RES,METAL 300 1% 1/4W
R112	S	1-214-116-00	RES,METAL 220 1% 1/4W
R113	S	1-214-116-00	RES,METAL 220 1% 1/4W
R114	S	1-214-084-00	RES,METAL 10 1% 1/4W
R115	S	1-214-084-00	RES,METAL 10 1% 1/4W
R116	S	1-214-084-00	RES,METAL 10 1% 1/4W
R117	S	1-214-084-00	RES,METAL 10 1% 1/4W
R118	S	1-214-084-00	RES,METAL 10 1% 1/4W
R119	S	1-214-084-00	RES,METAL 10 1% 1/4W
R120	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R121	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R122	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R123	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R124	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R125	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R126	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R127	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R128	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R129	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R130	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R131	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R132	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R133	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R134	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R135	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R136	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R137	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R138	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R139	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R140	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R141	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R142	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R143	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R144	S	1-214-084-00	RES,METAL 10 1% 1/4W
R145	S	1-214-137-00	RES,METAL 1.6K 1% 1/4W
R146	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R147	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R148	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R149	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R150	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R151	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R152	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R153	S	1-214-159-00	RES,METAL 13K 1% 1/4W
R154	S	1-214-167-00	RES,METAL 30K 1% 1/4W
R155	S	1-214-156-00	RES,METAL 10K 1% 1/4W

Ref.No. or Qty	SP	Part No.	Description
RB1	S	1-231-410-00	RESISTOR BLOCK 10K
RB2	S	1-231-410-00	RESISTOR BLOCK 10K
RB3	S	1-231-410-00	RESISTOR BLOCK 10K
RB4	S	1-235-005-00	RESISTOR BLOCK 47K
RV1	S	1-224-937-00	RES,ADJ,METAL 1K
RV2	S	1-224-937-00	RES,ADJ,METAL 1K
SW1	S	1-516-923-21	SWITCH,DIP
SW2	S	1-516-923-21	SWITCH,DIP
SW3	S	1-516-923-21	SWITCH,DIP

MT-16 BOARD

1pc O A-7850-301-A COMPLETE PCB,MT-16
(This assembly includes the following parts.)

1pc	O	1-526-662-00	SOCKET, IC (DP) 40P
1pc	S	2-251-622-00	LEVER, PC BOARD
1pc	O	3-673-867-00	PLATE, INDICATION, PC BOARD
1pc	O	4-911-704-01	LABEL (MT), PC BOARD
2pcs	S	7-626-317-21	PIN, SPRING 2.5x8
C1	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C2	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C3	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C4	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C5	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C6	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C7	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C8	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C9	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C10	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C11	S	1-131-449-11	CAP TANT 3.3 20% 16V
C12	S	1-131-449-11	CAP TANT 3.3 20% 16V
C13	S	1-131-449-11	CAP TANT 3.3 20% 16V
C14	S	1-131-449-11	CAP TANT 3.3 20% 16V
C15	S	1-131-449-11	CAP TANT 3.3 20% 16V
C16	S	1-131-449-11	CAP TANT 3.3 20% 16V
C17	S	1-131-449-11	CAP TANT 3.3 20% 16V
C18	S	1-131-449-11	CAP TANT 3.3 20% 16V
C19	S	1-131-449-11	CAP TANT 3.3 20% 16V
C20	S	1-131-449-11	CAP TANT 3.3 20% 16V
C21	S	1-131-449-11	CAP TANT 3.3 20% 16V
C22	S	1-131-449-11	CAP TANT 3.3 20% 16V
C23	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C24	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C25	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C26	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C27	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C28	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C29	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C30	S	1-102-106-00	CAP, CERAMIC 100P 10% 50V
C31	S	1-131-449-11	CAP TANT 3.3 20% 16V
C32	S	1-123-310-00	CAP, ELECT 470 20% 10V
C33	S	1-123-310-00	CAP, ELECT 470 20% 10V
C34	S	1-131-449-11	CAP TANT 3.3 20% 16V
C35	S	1-123-310-00	CAP, ELECT 470 20% 10V

Ref.No. or Qty	SP	Part No.	Description			Ref.No. or Qty	SP	Part No.	Description
C36	S	1-123-310-00	CAP,ELECT	470	20% 10V	IC3C	S	8-759-182-43	IC UPD8243C(M)
C37	S	1-130-789-00	CAP,FILM	1	5% 100V	IC3D	S	8-759-202-82	IC TC74HC85P
C38	S	1-107-085-00	CAP,MICA	100P	5% 50V	IC3E	S	8-759-202-82	IC TC74HC85P
C39	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC3F	S	8-759-202-82	IC TC74HC85P
C40	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC3H	S	8-759-202-82	IC TC74HC85P
C41	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC3J	S	8-759-202-76	IC TC74HC30P
C42	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC4B	S	8-759-203-17	IC TC74HC251P
C43	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC4C	S	8-759-203-17	IC TC74HC251P
C44	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC4D	S	8-759-202-24	IC TC74HC86P
C45	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC4E	S	8-759-202-24	IC TC74HC86P
C46	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC4F	S	8-759-202-24	IC TC74HC86P
C47	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC4H	S	8-759-202-24	IC TC74HC86P
C48	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC4J	S	8-759-202-76	IC TC74HC30P
C49	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC4K	S	8-759-001-39	IC MC74HC164N
C50	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC4L	S	8-759-001-39	IC MC74HC164N
C51	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC5D	S	8-759-203-52	IC TC74HC595P
C52	S	1-101-004-00	CAP,CERAMIC	0.01	50V	IC5E	S	8-759-203-52	IC TC74HC595P
D1	S	8-719-911-19	DIODE 1SS119			IC5F	S	8-759-203-52	IC TC74HC595P
D2	S	8-719-911-19	DIODE 1SS119			IC5H	S	8-759-203-52	IC TC74HC595P
D3	S	8-719-911-19	DIODE 1SS119			IC5J	S	8-759-202-20	IC TC74HC27P
D4	S	8-719-911-19	DIODE 1SS119			IC5K	S	8-759-202-74	IC TC74HC04P
D5	S	8-719-911-19	DIODE 1SS119			IC6B	S	8-759-926-31	IC AM26LS31PC
D6	S	8-719-911-19	DIODE 1SS119			IC6C	S	8-759-202-74	IC TC74HC04P
D7	S	8-719-911-19	DIODE 1SS119			IC6J	S	8-759-202-22	IC TC74HC74P
D8	S	8-719-911-19	DIODE 1SS119			IC6K	S	8-759-202-22	IC TC74HC74P
D9	S	8-719-911-19	DIODE 1SS119			IC6L	S	8-759-202-30	IC TC74HC161P
D10	S	8-719-911-19	DIODE 1SS119			IC7C	S	8-759-202-93	IC TC74HC153P
D11	S	8-719-911-19	DIODE 1SS119			IC7K	S	8-759-903-46	IC SN74LS625N
D12	S	8-719-911-19	DIODE 1SS119			Q1	S	8-729-900-46	TRANSISTOR DTC143TF
D13	S	8-719-911-19	DIODE 1SS119			Q2	S	8-729-900-46	TRANSISTOR DTC143TF
D14	S	8-719-911-19	DIODE 1SS119			Q3	S	8-729-900-46	TRANSISTOR DTC143TF
D15	S	8-719-911-19	DIODE 1SS119			Q4	S	8-729-900-46	TRANSISTOR DTC143TF
D16	S	8-719-911-19	DIODE 1SS119			Q5	S	8-729-900-46	TRANSISTOR DTC143TF
D17	S	8-719-911-19	DIODE 1SS119			Q6	S	8-729-900-46	TRANSISTOR DTC143TF
D18	S	8-719-911-19	DIODE 1SS119			Q7	S	8-729-900-46	TRANSISTOR DTC143TF
D19	S	8-719-911-19	DIODE 1SS119			Q8	S	8-729-900-46	TRANSISTOR DTC143TF
D20	S	8-719-911-19	DIODE 1SS119			Q9	S	8-729-900-46	TRANSISTOR DTC143TF
D21	S	8-719-911-19	DIODE 1SS119			Q10	S	8-729-900-46	TRANSISTOR DTC143TF
D22	S	8-719-911-19	DIODE 1SS119			Q11	S	8-729-900-46	TRANSISTOR DTC143TF
D23	S	8-719-911-19	DIODE 1SS119			Q12	S	8-729-900-46	TRANSISTOR DTC143TF
D24	S	8-719-911-19	DIODE 1SS119			Q13	S	8-729-900-46	TRANSISTOR DTC143TF
D25	S	8-719-911-19	DIODE 1SS119			Q14	S	8-729-900-46	TRANSISTOR DTC143TF
D26	S	8-719-911-19	DIODE 1SS119			Q15	S	8-729-900-46	TRANSISTOR DTC143TF
D27	S	8-719-911-19	DIODE 1SS119			Q16	S	8-729-900-46	TRANSISTOR DTC143TF
D28	S	8-719-911-19	DIODE 1SS119			Q17	S	8-729-987-42	TRANSISTOR 2SA874
D29	S	8-719-911-19	DIODE 1SS119			Q18	S	8-729-982-22	TRANSISTOR 2SB822
D30	S	8-719-911-19	DIODE 1SS119			Q19	S	8-729-987-42	TRANSISTOR 2SA874
D31	S	8-719-911-19	DIODE 1SS119			Q20	S	8-729-982-22	TRANSISTOR 2SB822
D32	S	8-719-911-19	DIODE 1SS119			Q21	S	8-729-987-42	TRANSISTOR 2SA874
D33	S	8-719-911-19	DIODE 1SS119			Q22	S	8-729-982-22	TRANSISTOR 2SB822
D34	S	8-719-911-19	DIODE 1SS119			Q23	S	8-729-987-42	TRANSISTOR 2SA874
D35	S	8-719-911-19	DIODE 1SS119			Q24	S	8-729-982-22	TRANSISTOR 2SB822
IC1C	S	8-759-763-49	IC UPD8749HD-MT01,EPROM			R1	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1D	S	8-759-202-55	IC TC74HC244P			R2	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1E	S	8-759-202-55	IC TC74HC244P			R3	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1F	S	8-759-202-55	IC TC74HC244P			R4	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1H	S	8-759-202-55	IC TC74HC244P			R5	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1J	S	8-759-202-83	IC TC74HC107P			R6	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1K	S	8-759-202-11	IC TC74HC00P			R7	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC1L	S	8-759-202-86	IC TC74HC123P			R8	S	1-214-101-00	RES,METAL 51 1% 1/4W
IC2D	S	8-759-203-21	IC TC74HC273P			R9	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC2E	S	8-759-203-21	IC TC74HC273P			R10	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC2F	S	8-759-203-21	IC TC74HC273P			R11	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC2H	S	8-759-203-21	IC TC74HC273P			R12	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC2J	S	8-759-202-74	IC TC74HC04P			R13	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC2K	S	8-759-202-76	IC TC74HC30P			R14	S	1-214-132-00	RES,METAL 1K 1% 1/4W
IC2L	S	8-759-202-76	IC TC74HC30P			R15	S	1-214-132-00	RES,METAL 1K 1% 1/4W

Ref.No. or Qty	SP	Part No.	Description
R16	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R17	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R18	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R19	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R20	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R21	S	1-214-124-00	RES,METAL 470 1% 1/4W
R22	S	1-214-124-00	RES,METAL 470 1% 1/4W
R23	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R24	S	1-214-180-00	RES,METAL 100K 1% 1/4W
R25	S	1-214-149-00	RES,METAL 5.1K 1% 1/4W
R26	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R27	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R28	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R29	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R30	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R31	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R32	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R33	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R34	S	1-214-095-00	RES,METAL 30 1% 1/4W
R35	S	1-214-095-00	RES,METAL 30 1% 1/4W
R36	S	1-214-095-00	RES,METAL 30 1% 1/4W
R37	S	1-214-095-00	RES,METAL 30 1% 1/4W
R38	S	1-214-095-00	RES,METAL 30 1% 1/4W
R39	S	1-214-095-00	RES,METAL 30 1% 1/4W
R40	S	1-214-095-00	RES,METAL 30 1% 1/4W
R41	S	1-214-095-00	RES,METAL 30 1% 1/4W
R42	S	1-214-095-00	RES,METAL 30 1% 1/4W
R43	S	1-214-095-00	RES,METAL 30 1% 1/4W
R44	S	1-214-095-00	RES,METAL 30 1% 1/4W
R45	S	1-214-095-00	RES,METAL 30 1% 1/4W
R46	S	1-214-095-00	RES,METAL 30 1% 1/4W
R47	S	1-214-095-00	RES,METAL 30 1% 1/4W
R48	S	1-214-095-00	RES,METAL 30 1% 1/4W
R49	S	1-214-095-00	RES,METAL 30 1% 1/4W
R50	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R51	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R52	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R53	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R54	S	1-214-140-00	RES,METAL 2.2K 1% 1/4W
R55	S	1-214-140-00	RES,METAL 2.2K 1% 1/4W
R56	S	1-214-140-00	RES,METAL 2.2K 1% 1/4W
R57	S	1-214-140-00	RES,METAL 2.2K 1% 1/4W
R58	S	1-214-149-00	RES,METAL 5.1K 1% 1/4W
R59	S	1-214-149-00	RES,METAL 5.1K 1% 1/4W
R60	S	1-214-149-00	RES,METAL 5.1K 1% 1/4W
R61	S	1-214-149-00	RES,METAL 5.1K 1% 1/4W
R62	S	1-214-156-00	RES,METAL 10K 1% 1/4W
RB1	S	1-231-411-00	RESISTOR BLOCK 100K
RB2	S	1-231-410-00	RESISTOR BLOCK 10K
RB3	S	1-231-410-00	RESISTOR BLOCK 10K
RB4	S	1-231-411-00	RESISTOR BLOCK 100K
RB5	S	1-231-407-00	RESISTOR BLOCK 2.2K
RB6	S	1-231-407-00	RESISTOR BLOCK 2.2K
RB7	S	1-231-411-00	RESISTOR BLOCK 100K
SW1	S	1-553-441-00	SWITCH,TOGGLE
SW2	S	1-516-925-21	SWITCH,DIP
SW3	S	1-516-925-21	SWITCH,DIP
SW4	S	1-516-925-21	SWITCH,DIP
X1	S	1-527-854-12	OSCILLATOR,CRYSTAL

Ref.No. or Qty	SP	Part No.	Description
DSP-3 BOARD			
lpc	O	A-7850-289-A	COMPLETE PCB,DSP-3
(This assembly includes the following parts.)			
CN101	O	1-556-921-00	FLAT CABLE ASSY
CN102	O	1-560-363-00	POST HEADER,ILG 12P
D1	S	8-719-907-76	DIODE BG5534S
D2	S	8-719-907-76	DIODE BG5534S
D3	S	8-719-907-76	DIODE BG5534S
D4	S	8-719-907-76	DIODE BG5534S
D5	S	8-719-907-76	DIODE BG5534S
D6	S	8-719-907-76	DIODE BG5534S
D7	S	8-719-907-76	DIODE BG5534S
D8	S	8-719-907-78	DIODE PR5534S
D9	S	8-719-907-78	DIODE PR5534S
D10	S	8-719-907-79	DIODE PY5534S
D11	S	8-719-907-76	DIODE BG5534S
D12	S	8-719-907-76	DIODE BG5534S
D13	S	8-719-907-79	DIODE PY5534S
D14	S	8-719-907-79	DIODE PY5534S
D15	S	8-719-905-31	DIODE PY5531K
D16	S	8-719-905-31	DIODE PY5531K
D17	S	8-719-905-31	DIODE PY5531K
D18	S	8-719-905-31	DIODE PY5531K
D19	S	8-719-905-31	DIODE PY5531K
D20	S	8-719-905-31	DIODE PY5531K
D21	S	8-719-955-31	DIODE PR5531K
D22	S	8-719-955-32	DIODE PG5531KX
D23	S	8-719-955-32	DIODE PG5531KX
D24	S	8-719-955-32	DIODE PG5531KX
D25	S	8-719-955-32	DIODE PG5531KX
D26	S	8-719-955-32	DIODE PG5531KX
D27	S	8-719-955-32	DIODE PG5531KX
D28	S	8-719-955-32	DIODE PG5531KX
D29	S	8-719-955-32	DIODE PG5531KX
D30	S	8-719-955-32	DIODE PG5531KX
D31	S	8-719-955-32	DIODE PG5531KX
D32	S	8-719-955-32	DIODE PG5531KX
D33	S	8-719-955-32	DIODE PG5531KX
D34	S	8-719-955-32	DIODE PG5531KX
D35	S	8-719-955-32	DIODE PG5531KX
D36	S	8-719-955-32	DIODE PG5531KX
D37	S	8-719-955-32	DIODE PG5531KX
D38	S	8-719-955-32	DIODE PG5531KX
D39	S	8-719-955-32	DIODE PG5531KX
D40	S	8-719-955-32	DIODE PG5531KX
D41	S	8-719-955-32	DIODE PG5531KX
D42	S	8-719-955-32	DIODE PG5531KX
D43	S	8-719-955-32	DIODE PG5531KX
D44	S	8-719-955-32	DIODE PG5531KX
D45	S	8-719-955-32	DIODE PG5531KX
D46	S	8-719-955-32	DIODE PG5531KX
D47	S	8-719-955-32	DIODE PG5531KX
D48	S	8-719-955-32	DIODE PG5531KX
D49	S	8-719-955-32	DIODE PG5531KX
D50	S	8-719-955-32	DIODE PG5531KX
D51	S	8-719-955-32	DIODE PG5531KX
D52	S	8-719-955-32	DIODE PG5531KX
D53	S	8-719-955-32	DIODE PG5531KX
D54	S	8-719-955-31	DIODE PR5531K
D55	S	8-719-955-32	DIODE PG5531KX
D56	S	8-719-955-32	DIODE PG5531KX
D57	S	8-719-955-32	DIODE PG5531KX
D58	S	8-719-955-32	DIODE PG5531KX
D59	S	8-719-955-32	DIODE PG5531KX
D60	S	8-719-955-32	DIODE PG5531KX

Ref.No. or Qty	SP	Part No.	Description
D61	S	8-719-955-32	DIODE PG5531KX
D62	S	8-719-955-32	DIODE PG5531KX
D63	S	8-719-955-32	DIODE PG5531KX
D64	S	8-719-955-32	DIODE PG5531KX
D65	S	8-719-955-32	DIODE PG5531KX
D66	S	8-719-955-32	DIODE PG5531KX
D67	S	8-719-955-32	DIODE PG5531KX
D68	S	8-719-955-32	DIODE PG5531KX
D69	S	8-719-955-32	DIODE PG5531KX
D70	S	8-719-955-32	DIODE PG5531KX
D71	S	8-719-955-32	DIODE PG5531KX
D72	S	8-719-955-32	DIODE PG5531KX
D73	S	8-719-955-32	DIODE PG5531KX
D74	S	8-719-955-32	DIODE PG5531KX
D75	S	8-719-955-32	DIODE PG5531KX
D76	S	8-719-955-32	DIODE PG5531KX
D77	S	8-719-955-32	DIODE PG5531KX
D78	S	8-719-955-32	DIODE PG5531KX
D79	S	8-719-955-32	DIODE PG5531KX
D80	S	8-719-955-32	DIODE PG5531KX
D81	S	8-719-955-32	DIODE PG5531KX
D82	S	8-719-955-32	DIODE PG5531KX
D83	S	8-719-955-32	DIODE PG5531KX
D84	S	8-719-955-32	DIODE PG5531KX
D85	S	8-719-955-32	DIODE PG5531KX
D86	S	8-719-955-32	DIODE PG5531KX
R1	S	1-214-116-00	RES,METAL 220 1% 1/4W
R2	S	1-214-116-00	RES,METAL 220 1% 1/4W
R3	S	1-214-120-00	RES,METAL 330 1% 1/4W

PS-81 BOARD
lpc O A-7804-024-A COMPLETE PCB,PS-81
(This assembly includes the following parts.)

C1	S	1-130-777-00	CAP,FILM 0.1 5% 100V
C2	S	1-130-789-00	CAP,FILM 1 5% 100V
C3	S	1-130-777-00	CAP,FILM 0.1 5% 100V
C4	S	1-130-789-00	CAP,FILM 1 5% 100V
C5	S	1-131-450-00	CAP,TANT 1M 20% 50V
C6	S	1-123-307-00	CAP,ELECT 100 20% 10V
C7	S	1-130-777-00	CAP,FILM 0.1 5% 100V
C8	S	1-123-307-00	CAP,ELECT 100 20% 10V
C9	S	1-130-789-00	CAP,FILM 1 5% 100V
C10	S	1-130-777-00	CAP,FILM 0.1 5% 100V
C11	S	1-130-789-00	CAP,FILM 1 5% 100V
C12	S	1-131-450-00	CAP,TANT 1M 20% 50V
C13	S	1-131-450-00	CAP,TANT 1M 20% 50V
C14	S	1-131-450-00	CAP,TANT 1M 20% 50V
C15	S	1-131-450-00	CAP,TANT 1M 20% 50V
C17	S	1-131-450-00	CAP,TANT 1M 20% 50V
C18	S	1-131-450-00	CAP,TANT 1M 20% 50V
C19	S	1-131-450-00	CAP,TANT 1M 20% 50V
C20	S	1-131-450-00	CAP,TANT 1M 20% 50V
C21	S	1-123-332-00	CAP,ELECT 47 20% 25V

Ref.No. or Qty	SP	Part No.	Description
C22	S	1-123-359-00	CAP,ELECT 47 20% 50V
C23	S	1-131-450-00	CAP,TANT 1M 20% 50V
C24	S	1-131-450-00	CAP,TANT 1M 20% 50V
C25	S	1-124-555-00	CAP,ELECT 1000 20% 16V
C26	S	1-123-359-00	CAP,ELECT 47 20% 50V
C27	S	1-131-450-00	CAP,TANT 1M 20% 50V
C28	S	1-131-450-00	CAP,TANT 1M 20% 50V
C29	S	1-131-450-00	CAP,TANT 1M 20% 50V
C30	S	1-131-450-00	CAP,TANT 1M 20% 50V
C31	S	1-102-963-00	CAP,CERAMIC 33P 5% 50V
C32	S	1-102-963-00	CAP,CERAMIC 33P 5% 50V
CN201	O	1-564-943-21	CONNECTOR,PC BOARD 12P
CN202	O	1-564-943-11	CONNECTOR,PC BOARD 12P
CN203	O	1-560-752-00	CONNECTOR,PC BOARD 9P
CN204	O	1-560-753-00	CONNECTOR,PC BOARD 5P
CN205	O	1-560-357-00	POST HEADER,ILG 3P
D1	S	8-719-230-02	DIODE 30DF2
D2	S	8-719-230-02	DIODE 30DF2
D3	S	8-719-230-02	DIODE 30DF2
D4	S	8-719-230-02	DIODE 30DF2
D5	S	8-719-200-02	DIODE 10E-2
D6	S	8-719-200-02	DIODE 10E-2
D7	S	8-719-200-02	DIODE 10E-2
D8	S	8-719-230-02	DIODE 30DF2
D9	S	8-719-230-02	DIODE 30DF2
D10	S	8-719-230-02	DIODE 30DF2
D11	S	8-719-230-02	DIODE 30DF2
D12	S	8-719-200-02	DIODE 10E-2
D13	S	8-719-200-02	DIODE 10E-2
D14	S	8-719-200-02	DIODE 10E-2
D15	S	8-719-200-02	DIODE 10E-2
D16	S	8-719-200-02	DIODE 10E-2
D17	S	8-719-200-02	DIODE 10E-2
D20	S	8-719-911-19	DIODE 1SS119
D21	S	8-719-911-19	DIODE 1SS119
D22	S	8-719-200-02	DIODE 10E-2
D23	S	8-719-200-02	DIODE 10E-2
D24	S	8-719-200-02	DIODE 10E-2
D25	S	8-719-200-02	DIODE 10E-2
D26	S	8-719-300-39	DIODE CTG-32R
D27	S	8-719-300-40	DIODE CTG-32S
D28	S	8-719-911-19	DIODE 1SS119
D29	S	8-719-911-19	DIODE 1SS119
D30	S	8-719-911-19	DIODE 1SS119
D31	S	8-719-911-19	DIODE 1SS119
IC1	S	8-759-900-72	IC NE5532P
LED1	S	8-719-903-43	DIODE PR3432S
LED2	S	8-719-903-43	DIODE PR3432S
LED3	S	8-719-934-33	DIODE PY3432S
LED4	S	8-719-934-33	DIODE PY3432S
LED5	S	8-719-903-43	DIODE PR3432S
LED6	S	8-719-914-32	DIODE PG3432S
LED7	S	8-719-914-32	DIODE PG3432S
LED8	S	8-719-903-43	DIODE PR3432S
PC1	S	8-719-120-23	DIODE PS2003B-KA
PC2	S	8-719-120-23	DIODE PS2003B-KA
PC3	S	8-719-120-23	DIODE PS2003B-KA
Q1	S	9-983-504-01	DIODE CTB-34
Q2	S	8-749-930-52	IC SI-3052V
Q3	S	8-749-990-05	IC STR9005
Q4	S	8-759-700-06	IC NJM7812B
Q5	S	8-759-179-12	IC UPC7912H

Ref.No. or Qty	SP	Part No.	Description
Q6	S	8-759-179-08	IC UPC7908H
Q7	S	8-729-984-70	TRANSISTOR 2SD847
Q8	S	8-729-900-07	TRANSISTOR 2SB757
Q9	S	8-729-385-52	TRANSISTOR 2SC2855
Q10	S	8-729-385-52	TRANSISTOR 2SC2855
Q11	S	8-729-217-03	TRANSISTOR 2SK170
Q12	S	8-729-385-52	TRANSISTOR 2SC2855
Q13	S	8-729-217-03	TRANSISTOR 2SK170
Q14	S	8-729-385-52	TRANSISTOR 2SC2855
Q15	S	8-729-301-55	TRANSISTOR 2SA1190
Q16	S	8-729-301-55	TRANSISTOR 2SA1190
Q17	S	8-729-301-55	TRANSISTOR 2SA1190
Q18	S	8-729-200-95	TRANSISTOR 2SJ74
Q19	S	8-729-385-52	TRANSISTOR 2SC2855
Q20	S	8-729-385-52	TRANSISTOR 2SC2855
Q21	S	8-729-301-55	TRANSISTOR 2SA1190
Q22	S	8-729-301-55	TRANSISTOR 2SA1190
R1	S	1-214-084-00	RES,METAL 10 1% 1/4W
R2	S	1-214-084-00	RES,METAL 10 1% 1/4W
R3	S	1-214-120-00	RES,METAL 330 1% 1/4W
R4	S	1-214-084-00	RES,METAL 10 1% 1/4W
R5	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R6	S	1-214-120-00	RES,METAL 330 1% 1/4W
R7	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R8	S	1-214-084-00	RES,METAL 10 1% 1/4W
R9	S	1-214-120-00	RES,METAL 330 1% 1/4W
R10	S	1-214-120-00	RES,METAL 330 1% 1/4W
R11	S	1-214-120-00	RES,METAL 330 1% 1/4W
R12	S	1-214-120-00	RES,METAL 330 1% 1/4W
R13	S	1-214-120-00	RES,METAL 330 1% 1/4W
R14	S	1-214-108-00	RES,METAL 100 1% 1/4W
R15	S	1-214-146-00	RES,METAL 3.9K 1% 1/4W
R16	S	1-214-864-00	RES,METAL 1K 1% 1/2W
R17	S	1-214-864-00	RES,METAL 1K 1% 1/2W
R18	S	1-214-161-00	RES,METAL 16K 1% 1/4W
R19	S	1-214-792-00	RES,METAL 1 1% 1/2W
R20	S	1-214-792-00	RES,METAL 1 1% 1/2W
R21	S	1-214-792-00	RES,METAL 1 1% 1/2W
R22	S	1-214-792-00	RES,METAL 1 1% 1/2W
R23	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R24	S	1-214-147-00	RES,METAL 4.3K 1% 1/4W
R25	S	1-214-127-00	RES,METAL 620 1% 1/4W
R26	S	1-214-127-00	RES,METAL 620 1% 1/4W
R27	S	1-214-154-00	RES,METAL 8.2K 1% 1/4W
R28	S	1-214-115-00	RES,METAL 200 1% 1/4W
R29	S	1-214-151-00	RES,METAL 6.2K 1% 1/4W
R30	S	1-214-151-00	RES,METAL 6.2K 1% 1/4W
R31	S	1-214-147-00	RES,METAL 4.3K 1% 1/4W
R32	S	1-214-792-00	RES,METAL 1 1% 1/2W
R33	S	1-214-792-00	RES,METAL 1 1% 1/2W
R34	S	1-214-792-00	RES,METAL 1 1% 1/2W
R35	S	1-214-792-00	RES,METAL 1 1% 1/2W
R36	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R37	S	1-214-148-00	RES,METAL 4.7K 1% 1/4W
R38	S	1-214-115-00	RES,METAL 200 1% 1/4W
R39	S	1-214-127-00	RES,METAL 620 1% 1/4W
R40	S	1-214-127-00	RES,METAL 620 1% 1/4W
R41	S	1-214-154-00	RES,METAL 8.2K 1% 1/4W
R42	S	1-214-139-00	RES,METAL 2K 1% 1/4W
R43	S	1-214-115-00	RES,METAL 200 1% 1/4W
R44	S	1-214-108-00	RES,METAL 100 1% 1/4W
R45	S	1-214-108-00	RES,METAL 100 1% 1/4W
R46	S	1-214-132-00	RES,METAL 1K 1% 1/4W
R47	S	1-214-156-00	RES,METAL 10K 1% 1/4W
R48	S	1-214-147-00	RES,METAL 4.3K 1% 1/4W
R49	S	1-214-147-00	RES,METAL 4.3K 1% 1/4W
R50	S	1-214-132-00	RES,METAL 1K 1% 1/4W

Ref.No. or Qty	SP	Part No.	Description
R51	S	1-214-156-00	RES,METAL 10K 1% 1/4W
RV1	S	1-224-925-00	RES,ADJ,METAL 200
RV2	S	1-224-927-00	RES,ADJ,METAL 1K
ZD1	S	8-719-175-07	DIODE RD7.5E
ZD2	S	8-719-175-07	DIODE RD7.5E
ZD3	S	8-719-143-07	DIODE RD4.3E-B
ZD4	S	8-719-116-07	DIODE RD16E
ZD5	S	8-719-116-07	DIODE RD16E
ZD6	S	8-719-162-07	DIODE RD6.2E-B
ZD7	S	8-719-162-07	DIODE RD6.2E-B
ZD8	S	8-719-162-07	DIODE RD6.2E-B
ZD9	S	8-719-162-07	DIODE RD6.2E-B
ZD10	S	8-719-100-29	DIODE RD5.1EB1
ZD11	S	8-719-191-07	DIODE RD9.1E
ZD12	S	8-719-191-07	DIODE RD9.1E
ZD13	S	8-719-100-29	DIODE RD5.1EB1
ZD14	S	8-719-100-29	DIODE RD5.1EB1
ZD15	S	8-719-191-07	DIODE RD9.1E
ZD16	S	8-719-191-07	DIODE RD9.1E
ZD17	S	8-719-100-29	DIODE RD5.1EB1
ZD18	S	8-719-100-29	DIODE RD5.1EB1
ZD19	S	8-719-100-90	DIODE RD24E-B2
ZD20	S	8-719-100-90	DIODE RD24E-B2
ZD21	S	8-719-136-07	DIODE RD3.6E-B

FU-32 BOARD

lpc	O	1-616-451-11	PC BOARD,FU-32
C1	S	△ 1-161-744-00	CAP,CERAMIC 10000P 400V
C2	S	1-131-449-11	CAP,TANT 3.3 20% 16V
C3	S	1-131-450-00	CAP,TANT 1 20% 50V
CN601	O	△ 1-560-176-00	CONNECTOR 2P
CN602	O	1-560-357-00	POST HEADER,ILG 3P
D1	S	8-719-200-02	DIODE 10E-2
F2	S	△ 1-532-634-00	FUSE,TEMPERATURE 10A
FH1	S	1-517-072-00	LAMP HOLDER
FH2	S	1-517-072-00	LAMP HOLDER
FH3	S	1-533-037-XX	HOLDER,FUSE
FH4	S	1-533-037-XX	HOLDER,FUSE
Q1	S	8-729-304-92	TRANSISTOR 2SB649A
R1	S	△ 1-217-632-00	RES,WIREWOUND 10 10% 10W
R2	S	1-214-136-00	RES,METAL 1.5K 1% 1/4W
R3	S	1-214-157-00	RES,METAL 11K 1% 1/4W
RY1	S	△ 1-515-357-00	RELAY

Ref.No. or Qty SP	Part No.	Description
MB-11 BOARD		
lpc	O A-7850-287-A	MOUNTED PCB,MB-11 (This assembly includes the following parts.)
CN001	O 1-562-893-11	CONNECTOR,PC BOARD 100P
CN002	O 1-562-893-11	CONNECTOR,PC BOARD 100P
CN003	O 1-562-893-11	CONNECTOR,PC BOARD 100P
CN004	O 1-562-893-11	CONNECTOR,PC BOARD 100P
CN005	O 1-562-893-11	CONNECTOR,PC BOARD 100P
CN006	O 1-562-893-11	CONNECTOR,PC BOARD 100P
CN007	O 1-562-893-11	CONNECTOR,PC BOARD 100P
CN008	O 1-562-893-11	CONNECTOR,PC BOARD 100P
CN010	O 1-560-753-00	CONNECTOR,PC BOARD 5P
CN011	O 1-560-360-00	POST HEADER,ILG 6P
CN012	O 1-560-360-00	POST HEADER,ILG 6P
CN013	O 1-560-362-00	POST HEADER,ILG 10P
CN014	O 1-560-362-00	POST HEADER,ILG 10P
CN015	O 1-560-358-00	POST HEADER,ILG 4P
CN016	O 1-560-726-00	HEADER,PIN 20P
CN017	O 1-560-723-00	CONNECTOR,PC BOARD 3P
CN018	O 1-560-360-00	POST HEADER,ILG 6P
CN019	O 1-560-361-00	POST HEADER,ILG 8P
CN020	O 1-560-361-00	POST HEADER,ILG 8P
CN021	O 1-560-178-00	CONNECTOR 6P
CN022	O 1-560-358-00	POST HEADER,ILG 4P
CN023	O 1-564-944-11	HEADER,MINIATURE 50P
CN024	O 1-560-724-00	HEADER,PIN 10P
FRAME		
lpc	S 1-558-096-11	CORD(WITH D SUB CONNECTOR)
C301	S 1-161-059-00	CAP,CERAMIC 0.047 10% 50V
C501	S 1-125-409-00	CAP,ELECT 22000 20% 50V
C502	S 1-125-409-00	CAP,ELECT 22000 20% 50V
C503	S 1-125-406-00	CAP,ELECT 56000 20% 16V
C504	S 1-125-407-00	CAP,ELECT 12000 20% 25V
C505	S 1-125-408-00	CAP,ELECT 10000 20% 35V
C506	S 1-125-408-00	CAP,ELECT 10000 20% 35V
CN010	O 1-561-863-00 O 1-561-067-00	PLUG,HOUSING,5P CONTACT,FEMALE
CN011	O 1-561-518-00 O 1-560-372-00	PLUG,HOUSING,6P CONTACT,FEMALE
CN012	O 1-561-518-00 O 1-560-372-00	PLUG,HOUSING,6P CONTACT,FEMALE
CN013	O 1-561-520-00 O 1-560-372-00	PLUG,HOUSING,10P CONTACT,FEMALE
CN014	O 1-561-520-00 O 1-560-372-00	PLUG,HOUSING,10P CONTACT,FEMALE

Ref.No. or Qty SP	Part No.	Description
CN015	O 1-561-516-00 O 1-560-372-00	PLUG,HOUSING,4P CONTACT,FEMALE
CN017	O 1-561-828-00 O 1-561-067-00	PLUG,HOUSING,3P CONTACT,FEMALE
CN018	O 1-561-518-00 O 1-560-372-00	PLUG,HOUSING,6P CONTACT,FEMALE
CN019	O 1-561-519-00 O 1-560-372-00	PLUG,HOUSING,8P CONTACT,FEMALE
CN020	O 1-561-519-00 O 1-560-372-00	PLUG,HOUSING,8P CONTACT,FEMALE
CN021	O 1-561-071-00 O 1-561-067-00	PLUG,HOUSING,3P CONTACT,FEMALE
CN022	O 1-561-516-00 O 1-560-372-00	PLUG,HOUSING,4P CONTACT,FEMALE
CN024	O 1-561-888-00 O 1-560-768-00	PLUG,HOUSING,10P CONTACT,FEMALE
CN102	O 1-561-521-00 O 1-560-372-00	PLUG,HOUSING,12P CONTACT,FEMALE
CN201	O 1-562-849-21 O 1-561-067-00	PLUG,HOUSING,12P CONTACT,FEMALE
CN202	O 1-562-849-11 O 1-535-206-00	PLUG,HOUSING,12P CONTACT,FEMALE
CN203	O 1-561-072-00 O 1-561-067-00	PLUG,HOUSING,3P CONTACT,FEMALE
CN204	O 1-561-863-00 O 1-561-067-00	PLUG,HOUSING,5P CONTACT,FEMALE
CN205	O 1-561-515-00 O 1-560-372-00	PLUG,HOUSING,3P CONTACT,FEMALE
CN301	S 1-507-507-00	JACK
CN401	S 1-509-184-31	RECEPTACLE,FEMALE,XLR3P
CN402	S 1-509-184-31	RECEPTACLE,FEMALE,XLR3P
CN403	S 1-509-176-31	RECEPTACLE,MALE,XLR3P
CN404	S 1-509-176-31	RECEPTACLE,MALE,XLR3P
CN405	O 1-562-261-00	RECEPTACLE,BNC
CN406	O 1-562-261-00	RECEPTACLE,BNC
CN407	O 1-562-261-00	RECEPTACLE,BNC
CN408	O 1-562-261-00	RECEPTACLE,BNC
CN409	O 1-562-261-00	RECEPTACLE,BNC
CN410	O 1-562-261-00	RECEPTACLE,BNC
CN411	O 1-562-261-00	RECEPTACLE,BNC
CN412	O 1-562-261-00	RECEPTACLE,BNC
CN413	O 1-562-261-00	RECEPTACLE,BNC
CN414	O 1-562-261-00	RECEPTACLE,BNC
CN415	O 1-562-261-00	RECEPTACLE,BNC
CN416	O 1-562-261-00	RECEPTACLE,BNC
CN417	O 1-562-261-00	RECEPTACLE,BNC
CN418	O 1-562-261-00	RECEPTACLE,BNC
CN419	O 1-562-261-00	RECEPTACLE,BNC
CN420	O 1-562-261-00	RECEPTACLE,BNC
CN421	O 1-562-261-00	RECEPTACLE,BNC
CN422	O 1-562-261-00	RECEPTACLE,BNC
CN423	S 1-509-095-00	8P MULTI SOCKET
CN424	S 1-509-095-00	8P MULTI SOCKET
CN426	S A 1-509-547-00	3P INLET
CN601	O 1-561-069-00 O 1-535-206-00	PLUG,HOUSING,2P (For CN601,FU-32 Board) CONTACT,FEMALE
CN602	O 1-561-515-00 O 1-560-372-00	PLUG,HOUSING,3P CONTACT,FEMALE

Ref.No. or Qty SP	Part No.	Description
CN801 O	1-560-006-00	TERMINAL, EI
O	1-561-156-00	CONNECTOR, EI HOUSING
O	1-560-406-00	PRESS TERMINAL, PLUG
O	1-560-524-11	PLUG HOUSING, EI CONNECTOR 5P (CN801 is added from Serial No. 12801 and higher.)
F1 S	△1-532-237-00	FUSE, TIME-LAG 3.15A (For AE and Model)
F1 S	1-532-713-00	FUSE, TIME-LAG 3A (For J and UC Models)
FL501 S	△1-421-518-00	FILTER, NOISE
R401 S	1-214-105-00	RES, METAL FILM 75 1% 1/4W
RV301 S	1-230-880-11	RES, VAR, CARBON 10K/10K RV24
SW301 S	△1-570-117-11	SWITCH, SEESAW (AC POWER)
SW302 S	1-553-247-00	SWITCH, TOGGLE
SW303 S	1-553-244-00	SWITCH, TOGGLE
SW304 S	1-553-244-00	SWITCH, TOGGLE
SW305 S	1-553-244-00	SWITCH, TOGGLE
SW306 S	1-553-247-00	SWITCH, TOGGLE
SW307 S	1-553-244-00	SWITCH, TOGGLE
SW308 S	1-553-244-00	SWITCH, TOGGLE
SW309 S	1-570-297-11	SWITCH, ROTARY
SW401 S	1-514-580-00	SWITCH, SLIDE
SW402 S	△1-526-572-00	SOCKET, POWER VOLTAGE SELECT
T501 S	1-448-295-11	TRANSFORMER POWER

D-3. ACCESSORIES SUPPLIED

Qty	SP	Part No.	Description
2pcs	O	A-7810-169-A	ADAPTER ASSY, RACK MOUNT (This assembly includes the following parts.)
1pc	O	2-241-803-00	HANDLE
1pc	O	4-911-711-01	ANGLE, RACK
1pc	O	4-911-712-01	COVER, RACK
2pcs	S	7-682-275-09	SCREW, +K5x10
1pc	S	A-7850-303-A	MOUNTED PCB, EX-71 (This assembly includes the following part.)
1pc	O	1-562-893-11	CONNECTOR, PC BOARD 100P
1pc	S	1-534-392-11	CONNECTION CORD
1pc	S	△1-534-827-00	CORD, POWER (For UC Model)
2pcs	S	1-551-475-51	CABLE ASSY
1pc	S	△1-556-760-11	CORD, POWER (3 CORE) (For AE Model)
1pc	S	1-558-180-11	CORD, POWER (For J Model)
4pcs	S	3-703-064-00	WASHER, ORNAMENT (DIA.5)
4pcs	S	7-682-378-04	SCREW, +RK5x16
4pcs	S	7-682-563-04	SCREW, +B4x12
4pcs	S	7-682-965-01	SCREW, +PSW4x16

SECTION E

PARTS CHANGE INFORMATION

At Sony, we continually strive to keep up with latest electronic developments by adding circuit and component improvements to our instruments as soon as they are developed and tested. The following information covers the parts change of the former units.

Electrical Parts List Changes

DA-15 BOARD

	DA-15 BOARD (Board No. 1-616-293-11) SERIAL NO.10001 to 10204 (PCM-1630 J, U/C) SERIAL No.10001 to 10126 (PCM-1630 AEP)			DA-15 BOARD (Board No. 1-616-293-12) SERIAL NO.10205 to 10800 (PCM-1630 J, U/C) SERIAL NO.10127 to 10800 (PCM-1630 AEP)			DA-15 BOARD (Board No. 1-616-293-13) SERIAL NO.10801 and higher (PCM-1630 J, U/C, AEP)		
Ref. No.	SP	Part No.	Description	SP	Part No.	Description	SP	Part No.	Description
D301	S	8-719-951-12	DIODE HZ5BLL		DELETED			DELETED	
D302	S	8-719-951-12	DIODE HZ5BLL		DELETED			DELETED	
IC104	S	8-759-240-53	IC TC4053BP	S	8-759-240-53	IC TC4053BP		DELETED	
IC112	S	8-741-136-70	IC BX-1367	S	8-741-139-10	IC BX-1391	S	8-741-139-10	IC BX-1391
IC113	S	8-741-136-70	IC BX-1367	S	8-741-139-10	IC BX-1391	S	8-741-139-10	IC BX-1391
IC204	S	8-759-240-53	IC TC4053BP	S	8-759-240-53	IC TC4053BP		DELETED	
IC212	S	8-741-136-70	IC BX-1367	S	8-741-139-10	IC BX-1391	S	8-741-139-10	IC BX-1391
IC213	S	8-741-136-70	IC BX-1367	S	8-741-139-10	IC BX-1391	S	8-741-139-10	IC BX-1391
R145	S	1-214-084-00	RES,METAL 10 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W
R146	S	1-214-156-00	RES,METAL 10K 1% 1/4W	S	1-214-158-00	RES,METAL 12K 1% 1/4W	S	1-214-158-00	RES,METAL 12K 1% 1/4W
R153	S	1-214-084-00	RES,METAL 10 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W
R161	S	1-214-180-00	RES,METAL 100K 1% 1/4W	S	1-214-964-00	RES,METAL 1M 1% 1/4W	S	1-214-964-00	RES,METAL 1M 1% 1/4W
R245	S	1-214-084-00	RES,METAL 10 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W
R246	S	1-214-156-00	RES,METAL 10K 1% 1/4W	S	1-214-158-00	RES,METAL 12K 1% 1/4W	S	1-214-158-00	RES,METAL 12K 1% 1/4W
R253	S	1-214-084-00	RES,METAL 10 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W	S	1-214-091-00	RES,METAL 20 1% 1/4W
R261	S	1-214-180-00	RES,METAL 100K 1% 1/4W	S	1-214-964-00	RES,METAL 1M 1% 1/4W	S	1-214-964-00	RES,METAL 1M 1% 1/4W
R301	S	1-215-493-00	RES,METAL 1M 1% 1/6W	S	1-215-485-00	RES,METAL 470K 1% 1/6W	S	1-215-485-00	RES,METAL 470K 1% 1/6W
R302	S	1-215-493-00	RES,METAL 1M 1% 1/6W	S	1-215-485-00	RES,METAL 470K 1% 1/6W	S	1-215-485-00	RES,METAL 470K 1% 1/6W
R303	S	1-247-894-00	RES,CARBON 430K 5% 1/6W	S	1-215-493-00	RES,METAL 1M 1% 1/6W	S	1-215-493-00	RES,METAL 1M 1% 1/6W
R304	S	1-249-433-11	RES,CARBON 22K 5% 1/6W	S	1-215-493-00	RES,METAL 1M 1% 1/6W	S	1-215-493-00	RES,METAL 1M 1% 1/6W
R305	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
R306	S	1-247-894-00	RES,CARBON 430K 5% 1/6W		DELETED			DELETED	
R307	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
R308	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
R309	S	1-247-894-00	RES,CARBON 430K 5% 1/6W		DELETED			DELETED	
R310	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
R311	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
R312	S	1-247-894-00	RES,CARBON 430K 5% 1/6W		DELETED			DELETED	
R313	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
R314	S	1-249-433-11	RES,CARBON 22K 5% 1/6W		DELETED			DELETED	
RV103	S	1-224-940-00	RES,ADJ,METAL 10K	S	1-226-278-00	RES,ADJ,METAL 20	S	1-226-278-00	RES,ADJ,METAL 20
RV104	S	1-224-940-00	RES,ADJ,METAL 10K	S	1-226-278-00	RES,ADJ,METAL 20	S	1-226-278-00	RES,ADJ,METAL 20
RV203	S	1-224-940-00	RES,ADJ,METAL 10K	S	1-226-278-00	RES,ADJ,METAL 20	S	1-226-278-00	RES,ADJ,METAL 20
RV204	S	1-224-940-00	RES,ADJ,METAL 10K	S	1-226-278-00	RES,ADJ,METAL 20	S	1-226-278-00	RES,ADJ,METAL 20
	DEC-15 BOARD (Board No. 1-616-296-11) SERIAL NO.12201 and higher								
Ref. No.	SP	Part No.	Description						
IC8F	S	8-759-001-39	IC MC74HC164N						

SIF-1 BOARD (Board No. 1-616-295-12) SERIAL NO.12801 and higher (PCM-1630 J, U/C, AEP)		
Ref. No.	SP	Part No. Description
R200	S	1-215-469-11 RES, METAL 100K 1½ 1/6W

FRAME SERIAL NO.12801 and higher (PCM-1630 J, U/C, AEP)		
Ref. No.	SP	Part No. Description
CN801	O	1-560-006-00 TERMINAL, EI
	O	1-561-156-00 CONNECTOR, EI HOUSING
	O	1-560-406-00 PRESS TERMINAL, PLUG
	O	1-560-524-11 PLUG HOUSING, EI CONNECTOR 5P